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ABSTRACT

The purpose of the course was to enable already trained personnel to keep abreast of recent developments in their field by providing the participants with an opportunity to: (1) acquire up-to-date techniques of documentation, especially in the sphere of the application of electronic apparatus; (2) learn techniques and ways of operating national documentation centers and (3) discuss effective means of promoting international cooperation in the field of documentation. Four sessions of the last part of the course were devoted to the review and summing up of the course in which the participants discussed the ways and means of promoting documentation activities and of developing documentation techniques in Asia. The records of these sessions are given in Annex 8 of this report. Other Annexes include: (1) subject of lectures and practices, (2) list of participants, (3) list of lectures, (4) time table, (5) country reports by participants, (6) syllabi of lectures and (7) proceedings of discussion. Specialists from nine countries attended the course: China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Singapore and Thailand. (Author/NH)

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TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

TOKYO,
20 July – 21 August 1970

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FINAL REPORT

LI 003 478

JAPANESE NATIONAL COMMISSION FOR UNESCO

1970

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I. INTRODUCTION

Background

1. The General Conference of Unesco at its fifteenth session (Paris, October-November 1968) authorized the Director-General to "assist in training documentalists..." (15 C/Resolution 4.421 (c)). Conforming to this resolution, Unesco was to promote the establishment of training courses in the field of documentation. On the other hand, there had been a growing and urgent need in Asian countries for trained documentation specialists. In view of such circumstances, the Japanese National Commission for Unesco decided to organize a training course in documentation techniques in Asia in close co-operation with Unesco.

Purpose

2. The purpose of the course was to enable already trained personnel to keep abreast of recent developments in their field so that national centres of scientific and technological documentation in the area may be operated in a more effective manner. For this purpose, the course provided the participants with an opportunity:

i) to acquire up-to-date techniques of documentation, especially in the sphere of the application of electronic apparatus,

ii) to learn techniques and ways of operating national documentation centres, and

iii) to discuss effective means of promoting international co-operation in the field of documentation.

Preparatory works

3. In preparing the programme of the Course, the Japanese National Commission for Unesco could have valuable suggestions and advice from Mr. O.A. Mikhailov, Director, Department of Documentation, Libraries and Archives, Unesco. The Commission was helped by the Japan Documentation Society.

4. The Commission appointed Mr. Yukio Nakamura, Director, Nippon Telecommunications Consulting Company, Dr. Takahisa Sawamoto, Professor, Faculty of Literature, Keio University, and Mr. Yutaka Kobayashi, Scientific Liaison Officer, Liaison and Research Office, Japan Information Centre of Science and Technology, as the Course Director and Assistant Course Directors respectively.

5. Under their guidance, the detailed programme of the Course was drawn up, with the co-operation of experts from the Japan Documentation Society, who met several times to discuss organization of the Course as well as selection of lecturers. Consideration was also made as to the selection of places where the participants would usefully visit during the Course.

II. ORGANIZATION AND PROGRAMME

Organization

6. The Training Course in Documentation Techniques in Asia was organized by the Japanese National Commission for Unesco with the financial and technical assistance from Unesco, and held for five weeks from 20 July to 21 August 1970 in Tokyo at the Yayoi Kaikan. The time table of the Course is shown in Annex 1 (DOCTEC/INF/4) of this Report.

Participants

7. The Japanese National Commission for Unesco extended invitation to 10 Asian Member States at the beginning of June 1970. The specialists in the field of documentation techniques who were nominated by the National Commissions for Unesco in the following 9 countries attended the Course: China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Singapore and Thailand. The list of participants is given in Annex 2 (DOCTEC/INF/2) of this Report.

Opening ceremony

8. The Opening ceremony of the Course was held on 20 July 1970 at 4 p.m. at the Akasaka Prince Hotel, Chiyoda-ku, Tokyo. Mr. Ryoji Ito, Secretary-General, Japanese National Commission for Unesco, in his opening address, extended to participants a warm welcome to Japan and emphasized the importance of a promotion of the documentation techniques in Asian countries. An address was made by Mr. Yukio Nakamura, Course Director, clarifying the purpose and programme of the Course. Dr. Haruo Ootuka, Chairman, Japan Documentation Society, also made an address appealing the exchange of information as well as specialists in the Asian region. Participants and lecturers introduced themselves.

9. Following the opening ceremony, a reception in honour of participants was given by the Secretary-General, Japanese National Commission for Unesco, in the same Hotel.

Working language

10. The working language in the Course was English. Consecutive interpretation between Japanese and English was provided when necessary.

Lectures

11. During the Course, 23 lectures were given by Japanese experts from universities, private enterprises and the Japan Information Centre of Science and Technology, on information retrieval systems, information processing, reprography, etc. Questions were welcome at any time during and after the lecture.

12. The subjects of these lectures and the names and positions of the lecturers are given in Annex 3 (DOCTEC/INF/1) and Annex 4 (DOCTEC/INF/3) of this Report respectively.

13. A summary in English of each lecture was prepared in advance and handed to the participants. The syllabi of lectures are also attached to this Report as Annex 5. (DOCTEC/LEC/1 ~ 20). In addition, several publications on documentation techniques were distributed to the participants as reference materials of the lectures.

Country report

14. Each participant had been requested to prepare a brief country report on the documentation activities in his/her own country. On the second day of the Course, exchange of views and information was made on the basis of these reports.

15. The above country reports prepared by participants are included in this Report as Annex 6 (DOCTEC/2).

Discussion

16. During the Course, two sessions were exclusively devoted to the discussion on the way and means for the international co-operation in the field of documentation. Mr. Yukio Nakamura took the chair of these sessions of discussion. A reference material and proceedings of this discussion are attached to this Report in Annex 7 (DOCTEC/DISC/1-1 and 1-2).

Observation tour and visits

17. During the Course, three days were dedicated to the tour in Kansai area. In this tour, the participants visited the Computer Centre of the 1970 World Exposition so as to observe the most up-to-date information system by utilizing computers.

18. Apart from the observation tour to Kansai area, visits to several institutions concerned were organized. Names of these institutions are as follows: the Japan Information Centre of Science and Technology, the Keio Institute of Information Science, the Electronical Communication Laboratory of the Nippon Telegraph and Telephone Public Corporation, the Ishikawajima-Harima Heavy Industries Co.,Ltd., the Kusuda Business Machines Co., Ltd., the Toppan Printing Co., Ltd., the Tokyo Printing Office of the Tokyo Shibaura Electric Co., Ltd., the National Diet Library, etc. Through these visits, the participants could have the opportunity of observing actual conditions of the latest documentation techniques in Japan.

Accommodation

19. During the period of the Course, except that of the observation tour to Kansai area, all the participants were accommodated at the Yayoi Kaikan, Bunkyo-ku, Tokyo. Transportation services by a micro-bus were provided for the visits.

Review and Summing up

20. Four sessions of the last part of the Course were devoted to the review and summing up of the Course of which the co-ordinator was Prof. Takahisa Sawamoto. On that occasion, the participants discussed the ways and means of promoting documentation activities and of developing documentation techniques in Asia. The records of these sessions are given in Annex 8 (DOCTEC/DISC/2-1 and 2-2) of this Report.

Certificate

21. At the closing ceremony held on 21 August 1970 at 11 a.m. at the Yayoi Kaikan, each participant was handed the certificate certifying the successful completion of the Course in the names of Mr. Ryoji Ito, Secretary-General, Japanese National Commission for Unesco, and Mr. Yukio Nakamura, Course Director.

ANNEX 1

Subject of Lectures and Practices

Distribution: limited

DOCTEC/INF/1
Tokyo, 21 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

SUBJECTS OF THE LECTURES AND PRACTICES

Division A. Comparative Studies on Conventional Information Retrieval
Division Chief: Mr. Y. Kobayashi

A1	Principles of Classification and Subject Indexing (Syllabus: DOCTEC/LEC/1)	Mr. Y. Kobayashi
A2	Files Classified by UDC (DOCTEC/LEC/2)	Mr. H. Onomura
A3	Files Alphabetically Arranged by Terms (DOCTEC/LEC/3)	Mrs. M. Nagakura
A4	Random-access Files (DOCTEC/LEC/4)	Mr. S. Nakamura
A5	Practice: UDC Files	Mr. H. Onomura
A6	Practice: Subject Files	Mrs. M. Nagakura
A7	Practice: Card Selectors	Mr. S. Nakamura

Division B. Information Retrieval in Life Sciences
Division Chief: Mr. Y. Tsuda

B1	IR Services in Medicine (DOCTEC/LEC/13)	Mr. T. Urata
B2	Index Medicus and Excerpta Medica (DOCTEC/LEC/12)	Mr. Y. Tsuda
B3	Manual Search Practice on Medicine	Messrs. T. Urata, Y. Tsuda and Y. Amano
B4	Information Sourses in Bio-agricultural Sciences (DOCTEC/LEC/5)	Mr. T. Sasaki
B5	New Plan for the National Agricultural Library (DOCTEC/LEC/5)	Mr. T. Sasaki
B6	Manual Search Practice on Bio-agricultural Sciences	Miss M. Okunomiya and Mr. T. Sasaki
B7	MEDLARS and MeSH (DOCTEC/LEC/11)	Miss T. Matsumura
B8	MEDLARS Indexing Search (DOCTEC/LEC/11)	Miss T. Matsumura

B9	MEDLARS Search Experiment and KWIC Index (DOCTEC/LEC/11)	Miss T. Matsumura
B10	Evaluation of MEDLARS (DOCTEC/LEC/11)	Miss T. Matsumura
B11	General Comments on MEDLARS (DOCTEC/LEC/12 contd.)	Mr. Y. Tsuda
B12	Chemical Abstract, Chemical Titles and CBAC (DOCTEC/LEC/9)	Mr. Y. Kobayashi
B13	Computerized CAS Services (DOCTEC/LEC/6)	Mr. S. Kimura
B14	Manual Search Practice on Biochemistry (DOCTEC/LEC/7 and LEC/8)	Messrs. Y. Kobayashi and M. Kurosawa

Division C. Principles of Information Processing

Division Chief: Mr. Y. Nakamura

C1	Indexing and File Organization (DOCTEC/LEC/15 and LEC/15 contd.)	Mr. Y. Nakamura
C2	Content Analysis and Abstracting (DOCTEC/LEC/14)	Miss D.U. Mizoguchi
C3	Subject Analysis: Theory (DOCTEC/LEC/15 contd.)	Mr. Y. Nakamura
C4	Computer Principles (DOCTEC/LEC/16)	Mr. E. Shu
C5	Computer Programming (DOCTEC/LEC/18)	Mr. I. Anzai
C6	Subject Analysis: Practice (DOCTEC/LEC/15 contd.)	Mr. Y. Nakamura
C7	Language Problems in Documentation (DOCTEC/LEC/15 contd.)	Mr. Y. Nakamura

Division D. Reprography Division Chief: Mr. M. Nakabayashi

D1	Copying in Documentation (DOCTEC/LEC/10)	Mr. T. Amano
D2	Microimages in Documentation (DOCTEC/LEC/17)	Mr. M. Nakabayashi
D3	Editing in Documentation (DOCTEC/LEC/19)	Miss D.U. Mizoguchi
D4	Printing Techniques in Documentation (DOCTEC/LEC/20)	Mr. M. Yamada
D5	Practice: Copying and Microimage techniques	Mr. M. Nakabayashi

ANNEX 2

List of Participants

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DOCTEC/INF/2
Tokyo, 14 August 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

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Mr. Wenlang TAI	Chief, EDP Centre of National Taiwan Science Hall. Mailing Address: c/o EDP Centre of National Taiwan Science Hall, 41 Nan Hai Road, Taipei, Republic of China.

Korea

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ANNEX 3

List of Lectures

Distribution: limited

DOCTEC/INF/3
Tokyo, 16 July 1970

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

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ANNEX 4

Time Table

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

TIME-TABLE

Monday 20 July 1970

13:00 - 14:30	Registration at the Yayoi-Kaikan.
16:00 - 17:00	Opening Ceremony at the Akasaka Prince Hotel
17:30 - 19:00	Reception given by Mr. Ryoji Ito, Secretary-General of the Japanese National Commission for Unesco, at the Akasaka Prince Hotel.

Tuesday 21 July

9:30 - 12:30	Presentation of and Discussion on Papers Prepared in Advance by Participants, Chairman: Takahisa Sa amoto Professor, Keio Univ.
14:00 - 17:00	ditto

Wednesday 22 July

10:00 - 12:00	Visit to the Japan Information Centre of Science and Technology.
14:00 - 16:30	ditto

Thursday 23 July

9:30 - 10:50 (A1)	Lecture: Principles of Classification and Subject Indexing, by Mr. Y. Kobayashi, Scientific Liaison Officer, JICST, at the Yayoi-Kaikan.
11:10 - 12:30 (A2)	Lecture: Files Classified by UDC, by Mr. H. Onomura, Staff, Technical Development Dept., Nippon Steel Corporation Ltd., at the Yayoi-Kaikan.
14:00 - 17:00	Practice: UDC File (Multiple entry), by Mr. J. Onomura, at the Yayoi-Kaikan.

Friday 24 July

9:30 - 10:30 (A1)	Lecture: Principles of Classification and Subject Indexing, by Mr. Y. Kobayashi, at the Yayoi-Kaikan.
11:10 - 12:30 (A3)	Lecture: Files Alphabetically Arranged by Terms, by Mrs. M. Nagakura, Librarian, National Institute for Educational Research of Japan, at the Yayoi-Kaikan.
14:00 - 17:00 (A6)	Practice: Subject Files, by Mrs. M. Nagakura, at the Yayoi-Kaikan.

Saturday 25 July

Free

Sunday 26 July

Free

Monday 27 July

9:30 - 10:50 (A1)	Lecture: Principles of Classification and Subject Indexing, by Mr. Y. Kobayashi, at the Yayoi-Kaikan.
11:10 - 12:30 (A4)	Lecture: Random access Files, by Mr. S. Nakamura, Chief Consultant, Consultant-Service Dept., Gaikoku Bunken Co. Ltd., at the Yayoi-Kaikan.
14:00 - 17:00 (A7)	Practice: Card Selectors, by Mr. S. Nakamura, at the Yayoi-Kaikan.

Tuesday 28 July

9:30 - 10:50 (B4)	Lecture: Information Sources in Bio-agricultural Field, by Mr. T. Sasaki, Librarian. Library of the Faculty of Agriculture, University of Tokyo, at the Yayoi-Kaikan.
11:10 - 12:30 (B5)	Lecture: New Plan for the National Agricultural Library, by Mr. T. Sasaki, at the Yayoi-Kaikan.
14:00 - 17:00 (B6)	Practice: Manual Search Practice (Bio-agricultural Sciences) by Mr. T. Sasaki and Miss M. Okunomiya, Librarian, Library of the Faculry of Agriculture, University of Tokyo, at the Yayoi-Kaikan.

Wednesday 29 July

9:30 - 10:40 (B12)	Lecture: Chemical Abstracts, Chemical Titles, and CBAC, by Mr. Y. Kobayashi, at the Library, Faculty of Medicine, Keio University.
11:00 - 12:10 (B13)	Lecture: Computerized CAS Services, by Mr. S. Kimura, Information Officer, Computer Centre, JICST, at the Library, Faculty of Medicine, Keio University.
13:40 - 16:00 (B14)	Practice: Manual Search Practice (Biochemistry), by Mr. Y. Kobayashi and Mr. M. Kurosawa, Chief, Research Section, Service Division, JICST, at the Library, Faculty of Medicine, Keio University.
16:40	Departure to Osaka by Super Express Train "Hikari No. 65" from Tokyo Station.
19:50	Arrival at Shin-Osaka Station. (Participants will stay at Osaka-Miyako Hotel and Shin-Osaka Hotel.)

Thursday 30 July

9:00	Departure to the Computer Centre in Expo'70 by bus.
17:00	Return to Hotels.

Friday 31 July

10:00	Departure to Kyoto for visits to cultural and historical sites, by bus.
17:00	Return to Hotels.

Saturday 1 August

13:05	Departure to Tokyo by Super Express Train "Hikari No. 44" from Shin-Osaka Station.
16:15	Arrival at Tokyo Station.

Sunday 2 August

Free

Monday 3 August

9:30 - 10:50 (B1)	Lecture: IR Services in Medicine, by Mr. T. Urata, Associate Professor, University of Tokyo, at the Library, Faculty of Medicine, Keio University.
11:10 - 12:30 (B2)	Lecture: Index Medicus and Excerpta Medica, by Mr. Y. Tsuda, Librarian, Library of the Faculty of Medicine, Keio University at the Library, Faculty of Medicine, Keio University.

Monday 3 August (continued)

14:00 - 17:00	Visit to the Electronical Communication Laboratory, Nippon Telegraph and Telephone Public Corporation.

Tuesday 4 August

9:30 - 12:30 (B3)	Practice: Manual Search Practice (Medicine), by Mr. T. Urara, Mr. Y. Tsuda and Mr. Y. Amano, Assistant Librarian, Library of the Faculty of Medicine, Keio University, at the Library, Faculty of Medicine, Keio University.
14:00 - 17:00	Visit to the Ishikawajima-Harima Heavy Industry Co., Ltd.

Wednesday 5 August

9:30 - 10:50 (B7)	Lecture: MEDLARS and MeSH, by Miss T. Matsumura, Special Assistant Librarian, Library of the Faculty of Medicine, Keio University, at the Library, Faculty of Medicine, Keio University.
11:10 - 12:30 (B8)	Lecture: MEDLARS Indexing and Search, by Miss T. Tatsumura, at the Library, Faculty of Medicine, Keio University.
14:00 - 17:00	Visit to the System Laboratory, Fujitsu Ltd.

Thursday 6 August

9:30 - 12:30 (B9)	Practice: MEDLARS Search Experiment and KWIC Index, by Miss T. Matsumura, at the Keio Institute of Information Science.
14:00 - 15:20 (B10)	Lecture: Evaluation of MEDLARS, Test Results, by Miss T. Matsumura, at the Keio Institute of Information Science.
15:40 - 17:00 (B11)	Lecture: General Comments on MEDLARS, by Mr. Y. Tsuda, at the Keio Institute of Information Science.

Friday 7 August

9:30 - 12:30 (C2)	Lecture: Content Analysis and Abstracting, by Miss D.U. Mizoguchi, Chief, Information Centre, Cancer Institute, at the Yayoi-Kaikan.
14:00 - 17:00 (C1)	Lecture: Indexing and file Organization, by Mr. Y. Nakamura, Director, Nippon Telecommunications Consulting Co., Ltd., at the Yayoi-Kaikan.

Saturday 8 August

Morning	Preparation for report

Sunday 9 August

	Free

Monday 10 August

9:30 - 12:30 (C4)	Lecture: Computer Principles, by Mr. E. Shu, Assistant Professor, Science University of Tokyo, at the Yayoi-Kaikan.
14:00 - 15:20 (D1)	Lecture: Copying in Documentation, by Mr. T. Amano, Head, Toshiba Printing Office, Toshiba Engineering Co., Ltd., at the Yayoi-Kaikan.
15:40 - 17:00 (D5)	Practice: Copying and Microimage Techniques, by Mr. M. Nakabayashi, Chief, Marketing-Recordaks Products, Kusuda Business Machines Co., Ltd., at the Kusuda Business Machines Co., Ltd.

Tuesday 11 August

9:30 - 12:30 (C5)	Lecture: Computer Programming, by Mr. I. Anzai, Head, Public Services Dpt., Mita Research Information Centre, Keio University, at the Yayoi-Kaikan.
14:00 - 15:20 (D2)	Lecture: Microimages in Documentation, by Mr. M. Nakabayashi, at the Kusuda Business Machines Co., Ltd.
15:40 - 17:00	Practice: Copying and Microimage Techniques, by Mr. M. Nakabayashi, at the Kusuda Business Machines Co., Ltd.

Wednesday 12 August

9:30 - 10:50 (C3)	Lecture: Subject Analysis, by Mr. Y. Nakamura, at the Yayoi-Kaikan.
11:10 - 12:30 (C4)	Lecture: Computer Principles, by Mr. Y. Nakamura, at the Yayoi-Kaikan.
14:00 - 15:20 (D3)	Lecture: Editing in Documentation, by Miss D.U. Mizoguchi,
15:40 - 17:00	Visit to the Toppan Printing Co., Ltd.

Thursday 13 August

9:30 - 12:30 (C3)	Lecture: Subject Analysis, by Mr. Y. Nakamura, at the Yayoi-Kaikan.
14:00 - 15:20 (D4)	Lecture: Printing Techniques in Documentation, by Mr. M. Yamada Manager, Technical Administration Dept., Ishikawajima-Harima Heavy Industry Co., Ldt., at the Yayoi-Kaikan.
15:40 - 17:00	Visit to the Toshiba Printing Office, Toshiba Engineering Co., Ltd.

Friday 14 August

	Preparation for report

Saturday 15 August

Morning	Preparation for report

Sunday 16 August

	Sightseeing tour to Mt. Fuji

Monday 17 August

9:30 - 10:50 (C7)	Lecture: Language Problems in Documentation, by Mr. Y. Nakamura, at the Yayoi-Kaikan.
11:10 - 12:30	Practice: Subject Analysis, by Mr. Y. Nakamura, at the Yayoi-Kaikan.
14:00 - 15:00	Visit to the Show Room of the Nippon Telegraph and Telephone Public Corporation.
15:30 - 16:00	Visit to the Electornic Technical Laboratory, Agency of Industrial Science and Technology.

Tuesday 18 August

9:30 - 12:30	Discussions on International Cooperation in the Field of Documentation, at the Yayoi-Kaikan: Coordinator, Yukio Nakamura.
14:00 - 17:00	ditto

Wednesday 19 August

10:00 - 12:30	Visit to the National Diet Library.
14:00 - 16:30	Visit to the Japan Information Centre of Science and Technology.

Tursday 20 August

9:30 - 12:30	Review, Summing-up andRecommendations, at the Yayoi-Kaikan: Coordinator, Takahisa Sawamoto.
14:00 - 17:00	ditto

Friday 21 August

10:00 - 11:00	Closing, at the Yayoi-Kaikan.

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DOCTEC/INF/1/Rev. Add. 2
Tokyo, 15 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

PRACTICAL INFORMATION FOR PARTICIPANTS

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Telephone: (453) 7211

Toppan Printing Co., Ltd.

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Chiyoda-ku, Tokyo

Telephone: (501) 5411

Japan Atomic Energy Research Institute

Address: Tokai-mura, Naka-gun, Ibaraki Pref.

Telephone: 02928-(2) 2211

National Diet Library

Address: 1-10 Nagatacho, Chiyoda-ku, Tokyo

Telephone: (581) 1161

ANNEX 5

Country Reports by Participants

Distribution: limited

DOCTEC/2/China
Tokyo, 21 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

REPORT ON THE ACTIVITIES IN THE FIELD OF SCIENTIFIC AND TECHNOLOGICAL DOCUMENTATION IN THE REPUBLIC OF CHINA

By Mr. Wen-lang Tai

The following is brief account of the acquisition, report and service of scientific documentation in the Republic of China.

I. Acquisition of scientific documentation:

Under provisions of the publication law, one copy each of all Chinese publications, including scientific documents, has been deposited with the National Central Library since 1930. For the implementation of both scientific research and economic growth, the National Central Library has endeavored to collect all the important scientific documentation made available at home and abroad to provide further documentation service.

The Scientific Documentation and Instrumentation Centre, SDIC, was established in September 1968 under the executive control of the National Science Council. One of its main tasks is the collecting and processing of documentation concerning science and technology. For improvement of service in the future, the SDIC has made a survey on the domestic science and technology facilities of leading libraries, universities and colleges as well as learned societies and research institutes. In addition, the SDIC has surveyed and acquisited all kinds of catalogs concerning science and technology, directory of scientific research organizations, buyer's guides, invention and patent information, government and learned society publications concrning science and technology.

II. The report of scientific documentation:

The Bibliographical Center, National Central Library, was established in 1960. It's publications are listed as follows.

1. Chinese Bibliography; a monthly list of new books in card catalog format with romanizations. Vol. 1, No. 1- Jan. 1970- (formerly Monthly List of Chinese Books)

2. Monthly List of Current Government Publications, 1970 to present.
3. Index to Chinese Periodicals, a monthly classified index to 476 periodicals with author index. Vol. 1, No. 1- Jan. 1970-
4. Directory of Chinese Periodicals, 1970.

For reference on the status of scientific research in the country, the Ministry of Education published a "Directory of Chinese Scientific Organizations" in 1956. Five years later, the National Central Library published a "Directory of the Cultural Organization of the Republic of China", the third revision of which will be published in July 1970. The Union Industrial Research Institute, UIRI, published a "List of Science and Technology Periodicals in Taiwan, Republic of China" in 1967.

The SDIC has played an important part in promoting scientific research in the Republic of China. The following are the projects scheduled before the end of 1972.

1. To survey and compile a union catalog of scientific periodicals in the college and university libraries and public and private enterprises.
2. To survey and compile a union catalog of scientific books in the college and university libraries and public and private enterprises.
3. To survey and compile a union catalog of scientific reports, theses, pamphlets, etc. in the college and university libraries and public and private enterprises.
4. To survey and compile a union catalog of scientific films, microfilms, microcards, etc.
5. To edit a periodical index to pure and applied science (1962 to present).
6. To edit an index to current periodicals in pure and applied science, a monthly.
7. To invite scholars to translate and compile scientific materials.
8. To establish courses on scientific information at graduate level and to arrange training courses for technical personnel to compile indexes, abstracts, bibliographies and to process data.
9. To distribute scientific documentation, current periodical catalog, current patent news, bibliography, abstract or index to interested groups.

III. Documentation service:

1. Photo-reproduction service: The Bibliography Center of National Central Library and the SDIC have the following equipments: xerox, microfilm and microfiche processing equipments.

2. Translation service: The SDIC provides translations of documents from foreign language into Chinese or visa versa.

3. Abstracting service: The SDIC will compile the periodical index or patent abstract.

In conclusion, I would like to say that the importance of science documentation to the nation's economic development has been fully recognized by the academic and industrial circles in this country. The government has made clear its science information policy and established its Scientific Documentation and Instrumentation Center (SDIC) under the direction of the National Science Council, and is prepared to cooperate with all interested governments and informational agencies. In this respect, I think the present seminar organized by the Japanese National Commission for UNESCO, serves as a very good example. In behalf of the participants from my country, I wish to express my deepest appreciation.

Distribution: limited

DOCTEC/2/Korea
Tokyo, 13 July 1970
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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

RECENT TRENDS OF INFORMATION ACTIVITIES IN KOREA

Chang Han Kim, Soon Ick Chong

Korean Scientific & Technological Information Center, Seoul, Korea

We are creating a New Wave in Asia. Riding on this wave, newly emergent nations are demonstrating that they can achieve political independence and economical self-sufficiency, giving up slavery and stagnancy once and for all.

The Republic of Korea has achieved a remarkable growth record during the 1960's in terms of basic economy, industrialization, exports, modernization and increased political stability. This rapid progress is confidently expected to continue unabated - even accelerated - into the coming decade of the 1970's.

Under the dedicated, democratic leadership of our president Chung Hee Park who has initiated the long-term slogan, "The path to reunification is the modernization and prosperity of Korea", we have successfully reached the goals set for its First Five-Year Economic Development Plan, ending in 1966, and attained most of the goals of the Second Five-Year Plan by the end of 1969, two years ahead of schedule.

Having established a firm basis of up-to-date industry and economic infrastructure, the nation looks forward confidently to becoming one of the fastest advancing countries in the world during 1970's, with the complete cessation of foreign grant type aid and the rising influx of development capital, business loans and joints ventures.

However, we are not going to be wholly dependent on foreign assistance. We also realize that the industrial or technological success can be attained not only by means of foreign capital investments but also by a rapid gathering of scientific & technological information from advanced countries. Effective adoption and digestion of this information should be able to create the most powerful and useful bridge between various research institutions, manufacturing plants and government planners for the sake of both national prosperity and the expansion of national power. This is where the Korean Scientific and Technological Information Center (KORSTIC) comes in as a unique organization in Korea.

KORSTIC, as a central organization in scientific information was established in January, 1962, in order that it might contribute to the promotion of science and technology in Korea by collecting scientific information from domestic and foreign sources, and then making it available to subscribers.

Unfortunately, our role as the unique information center was not widely recognized at that time. Our activities were limited by financial difficulties and staff shortage. However, as the importance of this information activity has been gradually recognized, aid by the Korean government became substancially increased. A new and modern office building which has a floor space of 5160 square meters has been completed on a beautiful site of 40,000 square meters last year. About 100 staff members are working at KORSTIC at this time and we wish to extend the number of our staff to 300 by the end of 1972. Our current running annual budget is about 110,000,000 Won, (equivalent to U.S. $370,000) and we are collecting 2400 titles of various monthly and weekly periodicals from more than 20 countries. The suppliers of these periodical publications are as follows:

U.S.A.:	32.3%
Japan:	28.9%
England:	16.8%
West Germany:	5.9%
Canada:	2.2%
France:	1.3%
Others:	12.6%

The institutional structure is composed of the board of trustees headed by Mr. Hu Rak Lee, now ambassador to Japan, and two divisions of administration and documentation under which ten sections are organized. A secretary-general commands them under the direction of the trustee board.

The purpose and activities of KORSTIC can be briefly summarized as follows:

1. Collection of scientific information materials from domestic and foreign sources.

2. Classification, storage and retrieval of information and the management of information materials.

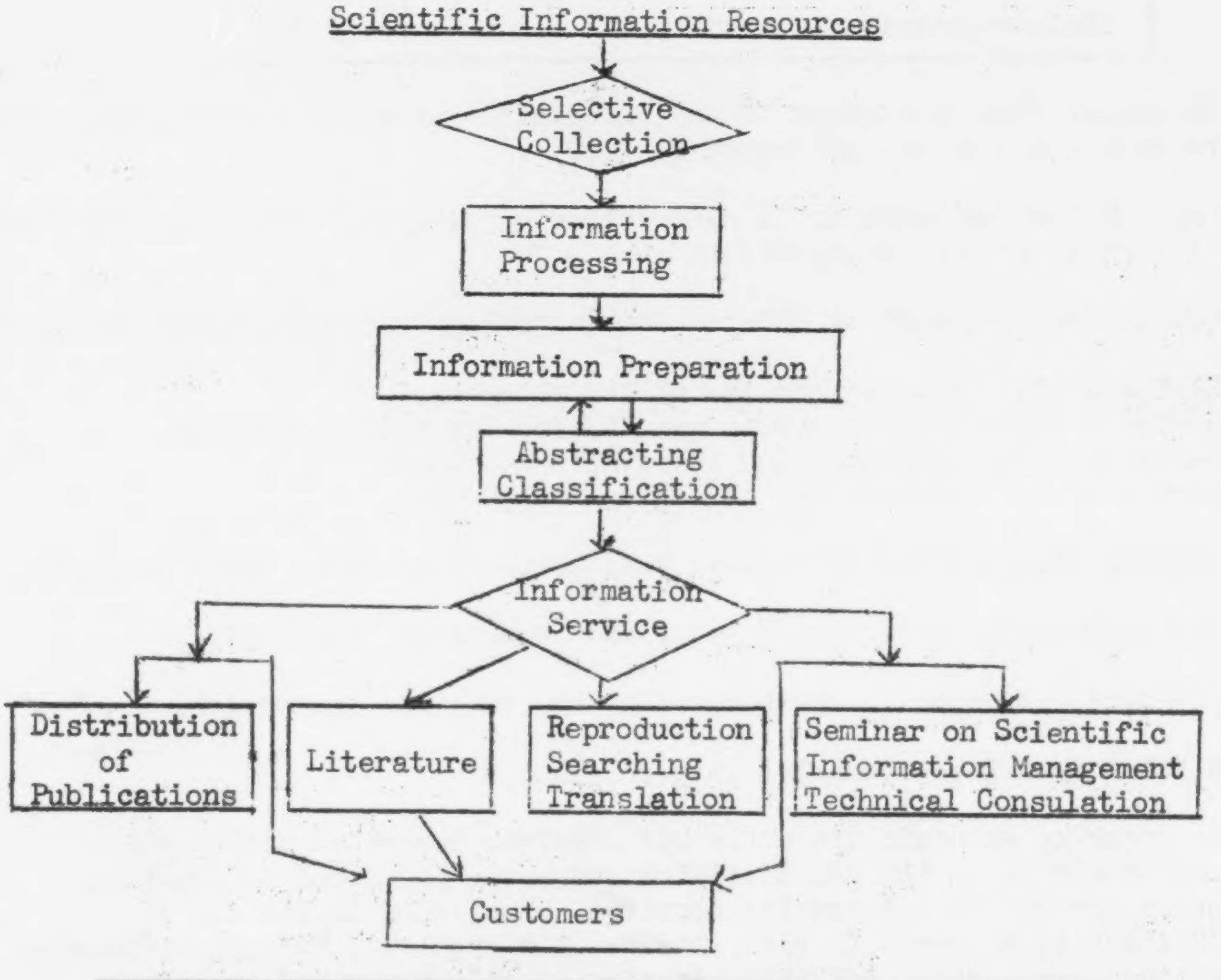
3. Editing and publication of secondary literature such as indexes and abstracts of domestic and foreign science information.

4. Various science information services including photo-reproduction, technical translation, literature searching, content sheet service, and consultation concerning information problems.

5. Facility service for public reading, seminar and various meeting activities.

6. Co-operation for the science information activities among Korean science communities and those of foreign countries through the publication of "the Union Catalogue of Foreign Scientific Journals" maintained in Korea, and also acting as a technical library for foreign publications as well as for Korean materials. For a further understanding of the function of KORSTIC, a flow chart is given here as a visual aid.

FUNCTION OF KORSTIC


Scientific Information Resources
Selective Collection
Information Processing
Information Preparation
Abstracting Classification
Information Service
Distribution of Publications
Literature
Reproduction Searching Translation
Seminar on Scientific Information Management Technical Consulation
Customers
Colleges
Industry
Research Institutes
Government and Allied Organizations
Trading Firm

As for activities, our information processing, for example, has been remarkably increased. A table below shows its progress.

Record of Information Processed

	1968	1969
Non-patent information	41,000	65,400
Patent information	50,000	52,000
Photo-reproduction service	6,600	10,500

We expect that the amount of the information processing this year, 1970, will be double the amount processed in 1969.

Our publication activity is also actively going on. The following list gives the names of our publications.

1. Current Bibliography on Science and Technology (monthly, index journal).

   Series A (1): Physics and its allied sciences.
   Series A (2): Engineering in general and its allied sciences.
   Series B : Chemistry and its allied sciences.
   Series C : Biology and its allied sciences.

2. Current Bibliography on Foreign Patents (semi-monthly, index journal).

3. The Highlights of Foreign Science and Technology (monthly).

4. The Korean Scientific Abstracts (English edition, quarterly).

5. KORSTIC News Paper (weekly) is also planned.

In order to maintain the efficient services described above, the emphasis should be on the mechanization and newly developed information processing system for information services. According to the aim of KORSTIC which is to serve foreign and domestic inquirers through systematic acquisition, processing, and sissemination of scientific and technical information, the Electronical Data Processing System and/or Punched Card System are being adopted in the near future.

The present status of a study on the mechanization of information processing in KORSTIC is described as follows:

The committee on the Mechanization of Information Processing was composed for the preparation of the study concerned in 1968, and the specialist training program has been carried out subsequently.

Six members of KORSTIC have been trained in the field of EDPS, and their training experiences are expected to be applicable for the practical purpose described bellow.

An additional eight members are to be trained by 1971.

The Korean-language thesaurus for information indexing and retrival is expected to be started under the government project in 1971.

Considering the newly developed computer-controlled system by the Japan Information Center for Science and Technology (JICST) which is capable of editing and photo-composing a journal in the Japanese Language, the possibility of Koreanization of the system is under investigation.

Under the KORSTIC plan, the related equipments and accessories will be introduced by 1972 and the committee will continue studying for more extensive usage of this equipment.

We have to also note that, as of 1969, there was a total of 273 libraries, specified as follows:

1. Public libraries 57
2. University libraries 117
3. Specialized libraries ... 99

They are participating in an active role in information activities.

We all recognize that our human race has boomed into a space age of information activity. The cultural gap between developed and undeveloped countries seems to be widening at an ever increasing pace. This is due in part to the fact that effective computerization in developed countries propells them much faster than in the latter. The only way to diminish this gap is to rely upon intensified information activities. We want to absorb useful knowledge from the former as fast as we can so that we will be able to advance ourselves with better speed.

As we stated at the beginning, we are creating a New Wave in Asia. This New Wave should be made to serve as a great testimony of what an awakened nation can do in its own way to achieve development and progress. We know that it can be possible only through international co-operation. We sincerely desire ever-lasting mutual support and active co-operation from our friendly nations all over the world.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

Brief report on the Scientific and Technological Documentation in India

B. Guha,

Indian National Scientific Documentation Centre

The tempo and success of documentation activity is determined by the degree of intensity and sophistication of the research, industrial and social environment of a country. The logic of the situation in a developing country like India obliges the government to take the initiative in the establishment and nourishment of documentation service relying heavily upon the ready-made scope provided in the laboratories, research institutions and universities run on public funds.

Expenditure on Research

It would be worthwhile to rehearse a few facts and figures to show the enormous increase in public expenditure, in recent years, to change the research environment of the country. In 1968-69, a sum of Rs 1,152 million was spent on scientific research. The breakdown of this expenditure according to the main research complexes in the country is as follows:

		In million Rupees	Percentage
1.	Council of Scientific & Industrial Research (C.S.I.R.)	199.7	17.3
2.	Atomic Energy Commission	229.6	19.9
3.	Indian Council of Agricultural Research	126.5	10.9
4.	Defence Research and Development	141.2	12.2
5.	Indian Council of Medical Research	16.4	1.4
6.	Central Govt. institutions	292.1	27.7
7.	State Govt. institutions	69.0	6.0
8.	Private Sector institutions	50.0	4.6

(Note: $ 1 (U.S.) = Rs 7.50 approximately)

It is interesting to note that about 95% of the expenditure on scientific research is from the public sector and again 90% of the expenditure is accounted by the Central Government. An idea of the rapid growth of Central Government expenditure on research after the war can be obtained from the following figures:

Central govt. expenditure on research
(in million rupees)

Year	Amount Rs
1950-51	46.85
1955-56 (end of 1st Plan)	121.33
1960-61 (end of 2nd Plan)	299.23
1965-66 (end of 3rd Plan)	691.90
1966-67 (4th Plan annual)	881.05
1967-68 (4th Plan annual)	929.63
1968-69 (4th Plan annual)	1033.15

The percentage of research and development expenditure in Gross National Product stood at 0.38 in 1968-69, which was as low as 0.06 before the launching of the First Plan. Yet another measure of the growth of this expenditure is indicated by the per capita expenditure on scientific research which increased steadily from a poor Rs 0.14 in 1950-51, to Rs 0.40 in 1955-56, to Rs 1.52 in 1965-66 and finally to Rs 2.20 in 1968-69.

During the same period, it has been estimated, the scientific and technical manpower in India has been doubling every five to seven years. In 1950 the strength was about 1,61,600 which rose to 9,47,000 in 1968, thus rising by a factor of 5.9.

Interest in Documentation

The recent Conference on the Application of Science and Technology in the Development of Asia (CASTASIA, New Delhi, 9-20 August, 1968) has very significantly emphasized that efforts must be made by every developing country to build up an appropriate "infra-structure" for the most fruitful application of science and technology. Even before this explicit pronouncement by the governments of the Asian countries, the Indian Government's interest and concern in documentation and information service as a necessary support to the accelerated developmental activities in the country were clearly evinced by the setting up of a number of committees, since 1950, to consider the matter. However, the most significant development in the Indian scene of documentation was the establishment of the Indian National Scientific Documentation Centre (INSDOC) in 1952.

It should be made clear here that even before the establishment of INSDOC some efforts were made to go a little beyond the traditional library activities and provide some sort of documentation service for bigger groups that could be served by an individual library or institution. A notable frature in all such attempts was that the scientists themselves had planned and executed such services. This is quite significant as it showed that the scientific community was in real need of such documentation service and also revealed to a certain extent the types of services they needed most. In fact the National Institute of Sciences of India, modelled on the lines of the Royal Society of London, started an abstracting periodical, entitled Indian Science Abstracts in 1936, to control the increasing volume of research papers published by the Indian scientific community. However, this service could not continue beyond 1939.

In a few specific areas of research and study also the respective institutions took the initiative to provide abstracting or indexing services. The abstracting services of Central Board of Irrigation and Power and the Forest Research Institute are notable ventures in this direction. The Irrigation and Power Abstracts, started in 1943, still continues and has set quite a high standard in abstracting practices.

The Setting up of INSDOC

INSDOC was set up in 1952, with the cooperation of Unesco for providing documentary services for existing and projected national laboratories, scientific research institutions, technological institutions, universities, branches of industry, etc. The then concept of a national documentation centre is clearly focused in the statement of objectives of this Centre which were as follows - i) to receive and retain all scientific periodicals which may be of use to the country, ii) to inform scientists and engineers of articles which may be a value to them by issuing a monthly bulletin of abstracts, iii) to answer specific enquiries from information available in the Centre, iv) to supply photocopies or translations of articles required by individual workers, v) to be a national depository for reports of the scientific work of the nation, both published and unpublished, and vi) to be a channel through which the scientific work of the nation is made known and available to the rest of the world.

National Science Libraries and Information Centres

It is quite obvious that to provide effective documentation and information service on a very large scale, any agency would require a rich collection of documents of all types as its base of operation. This is exactly what was envisaged in the very first objective mentioned above. With more than seventeen years of service and operational experience, Insdoc has now formulated a plan for the setting up of a National Science Library. This library would have a cooperative acquisition programme, with the material relevant to the various national laboratories located in the laboratories themselves and other national institutions but integrated through a national union catalogue centrally situated and also regionally disbursed through reprographic techniques. It would survey the holdings of scientific organizations in the country and supplement the lacunae in their collections by itself acquiring them. It would act as a dormitory for housing very old periodical runs. In addition to scientific periodicals, the National Science Library will also acquire other scientific publications like reference works, research reports, conference proceedings, theses, patents, state of art publications, cover-to-cover translations, etc.

It has also been realized that just one such big library cannot effectively serve all branches of science and technology. As a result during the past three years or so a new pattern is taking shape. Apart from Insdoc's effort to coordinate documentation the concept of national information networks for a few specialized subjects has started gaining ground. These networks aim to centralize some services and decentralize others. These also aim to integrate, exploit and augment the existing information resources like technical literature, personnel and equipment on a national level. This trend is discernible in the thought that has been bestowed to the national grids for Electronics, Agriculture, Aeronautics and Medicine. As a matter of fact, the Government of India has declared the Central Medical Library of the Director-General of Health Services as a National Medical Library in April, 1966. The national grids for Electronics, Agriculture and Aeronautics are in the planning stage. The concept of 'information net-work' has undoubtedly added a new dimension to the organization of documentation services in India. The industries, main public sector enterprises, have started evincing interest in documentation. This will eventually load to the formation of national information networks for steel, petroleum, metallurgy, textiles, cement and fertilisers, etc.

As in all countries, the vast scientific complex servicing defence needs has certain special problems. The individual documentation efforts of a number of defence laboratories have now been integrated through a central agency at Delhi, named as the Defence Scientific Documentation Centre (DESIDOC). INSDOC hope to have closest cooperation with will all these specialised information centres and libraries.

Some Recent Works of INSDOC

Services: Insdoc introduced the reprographic and translation services from its very inception. Demand on both these services has been steadily increasing through the years. At present it handles about 15,000 requests for procurement of copies of documents and about 400 requests for translation per years.

Abstracting services: In lieu of the Bibliography of Scientific Publications of South & South-East Asia, which was being published by INSDOC till 1964, a comprehensive monthly abstracting periodical, the Indian Science Abstracts has been started by INSDOC in 1965. This service is a true representation and dependable record of the scientific activities in the country as reflected in articles in periodicals and publications like patents, standards, theses, etc.

INSDOC is also publishing an abstracting journal in Education, entitled India Education Material under contract from the National Science Foundation of the United States.

Directories: In the acquisition, selection in abstracting and indexing services, and in general organization of periodicals we very often feel the need for a comprehensive and completely reliable directory of periodicals. INSDOC compiled such a directory in 1965 entitled Directory of Indian Scientific Periodicals and has brought out a revised edition of it in 1968.

In 1969 INSDOC has published another useful directory, entitled the Directory of Scientific Research Institutions in India, which lists about 913 institutions including some university science departments.

Union Catalogues: It would be evident that in the new concept of the National Science Library, as mentioned earlier, whereby the existing bigger libraries are to be linked into a service network without, of course, transgressing on their independence in anyway, union catalogues will have a very important role to play. In fact the regional union catalogues will be the most important instrument to give shape and substance to the concept of a network. INSDUC has taken upon itself the compilation and maintenance of a National Union Catalogue of scientific serials. Before that a series of uniform and completely reliable catalogues to form the base for the final union catalogue are being published. In fact, INSDOC has already compiles and published a number of individual and regional catalogues representing either the massive holdings of important organization of long standing or the holdings of groups of libraries in important cities or states.

Other Organizations with Documentation Activities

Although INSDOC dominates the national scene as a whole, there are quite a few institutions and centres which are providing documentation services to limited clientele, mostly within their respective organizations. There are even a few services and initiatives which go beyond servicing the immediate clientele. Notable amongst these are the Irrigation and Power Abstracts (1943-), the Documentation Notes (1954-) of the Design and Standards Organization of the Ministry of Railways, the CRI Abstracts (1968-) of the Cement Research Institute, the Packaging Abstracts (1968-), etc.

There are also at least 14 cooperative research associations of some of the major industries, like textiles, silk, cement, jute, coffee, etc, which provide documentation facilities. Mention may be made of the Ahmedabad Textile Industry's Research Association which has established a long tradition of documentation work to the particular industry.

Training in Documentation

Apart from the 24 university departments in library science, where there have been some emphasis on documentation techniques in recent years, there are only two centres to impart education in documentation. One of them is the Documentation Research and Training Centre (D.R.T.C.) at Bangalore which started its course in 1962 under the guidance of Dr. S.R. Ranganathan, and the other is the Insdoc's training course, started in 1964.

Impact of Technology

In 1964 INSDOC created a special cell to experiment in the computer processing of bibliographical information. Since then it has perfected programmes for regularly processing author and subject indexes to the Indian Science Abstracts and has also developed techniques and programmes for the processing of information for directory and union catalogue compilation work. In 1969 INSDOC organized a Seminar on Automation regarding library and documentation work. This seminar started a dialogue, so to say, between the documentalists and the computer technologists of the country.

Conclusion

Considering the present ferment in the world of documentation in India, it is difficult to peep into too distant a future. The trend indicates a growing awareness of the value of information in the nation's development. An obvious task is to expand, reorganize and equip the existing national agency, i.e. INSDOC to enable it to undertake new responsibilities.

It would be also clear from this brief survey that governmental support and initiative is playing an important part in the provision of documentation facilities. A real clamour for information service is yet to develop in the country due to the absence of a strongly developed industrial and technological complex. This may be partly due to the fact that in some of our industries technology is imported and there is hardly any vigorous competition necessitating the application of new knowledge to the development of better products. Hence, there is hardly any awareness in the country, of recent world developments like the UNISIST or the CODATA and such activities.

Distribution: limited

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Tokyo, 21 July 1970
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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

DOCUMENTATION ACTIVITIES IN INDIA

by Dr. Jagadish Saran Sharma

In view of the fact that India claims to have a rich literary heritage, Documentation, in some form, existed in any country even in the Vedic period. It is pity that those of us who are not familiar with it, believe that in the field of Documentation, we are a developing nation. A little probe into the matter will prove that Documentation was done in the ancient India. Great scholars such as Arther A. Macdonell, M. Winternity, Theodor Goldstucker, Max Muller and a few other orientalists, in their learned treatises clearly indicatesthat there existed in the Vedic period "indexes", "catalogues" and "lists" which give number of contents of the Vedic Semhitas with regards to different items. These books are called Anukramanikas and contain lists of the hymns, the authors, the form of sutras and the number of verses, the name and the family of the Rishis to whom the hymn is ascribed and the metre or metres in which the hynm is composed.

Apart from the Vedic times, Documentation was also done during the Epic period. It is said that when Janamejaya found it difficult to recite daily the complete text of Mahabharta the sage Vyasa for his convenience made on index for him which is called Anukaremanika. Besides, Panini's work itself may be classified as fore-runner of any type of Documentation known to the modern world so far.

My purpose of tracing the origin and development of the concept of Documentation in India during the last 3000 years, is that Indians knew the uses of Documentation, even earlier than Europeans had known about their first alphabet. But during the long period of slavery and subjugation India had lost its literary glory and vigour. Some go upto the extent to state that we simply have been reduced to a group of helpless espectators.

POST INDEPENDENCE PERIOD (after 1947)

On August 15th 1947 India became a free nation. Along with other things, a new lease of life was given to the old concept of Documentation. With the establishment of Council of Scientific and Industrial Research (CSIR) near about 35 national laboratories have come into existance. A number of other research institutions pertaining to Biological and Physical Sciences, Humanities and Social Sciences have also been established. Only last year, the Government of India instituted the Indian Council of Social Science Research with the aim to person research in the field of Social Sciences. This tremendous upsurge for research has prompted the research worker for a demand of a documentation service based on scientific lines.

The establishment of INSDOC in New Delhi in 1952, with the generous assistance of the UNESCO, was another a landmark in the field of Documentation in India. Shni B. Guha has already presented to you a few minutes ago, its activities in details. However, I too would like to say a few words about its important activities. The INSDOC started publishing a fortnightly INSDOC list of Current Scientific Literature with a purpose to index, all the scientific periodicals which may be of use to the country; to publish abstracts of selected articles of research value; to supply translations of articles to the requesting individuals researchers; to supply reprographic facilities to the scientists engaged in research; and to be a channel of communication between the Indian scientists, and the scientists abroad.

In 1965 INSDOC started another publication namely "Indian Science Abstracts". It is monthly, printed, and classified record under UDC of the articles and books published by Indian Scientists. It also has author and key word indices at the end.

Besides the activities of the INSDOC, several other institution are also engaged in Documentation work and services. Mention may be made of the following:

(a) GEERI Documentation List 1965 -- brought out Central Electronics Research Institute, Pilani. It is a monthly, mimeographed publication and classified under UDC.

(b) DESIDOC List of Current Scientific Literature, 1964 -- brought out of Defence Science Organization, New Delhi. It is a fortnightly, printed publication classified under UDC; also provides an Index to the subject Headings used.

(c) Classified Documentation List of Current Scientific Literature -- 1964: -- published by Control Salt and Marine Chemicals Research Institute, Bhaunagar. It is a monthly mimeographed publication classified under UDC.

Documentation activity in the Social Sciences field is also another a phenomena of recent origin. The Indian Council of Would Affairs Library, New Delhi, has done a pioneering job. Its regular publication "Documentation on Asian Affairs" is worth mentioning. Another important effort has been done by Shni N.N. Gidwani, Director of the Rajasthon University Libraries, by bringing out the regular quarterly publication INDEX INDIA since May 1967.- The scope of the subjects covered in the INDEX extends to the field of Social Sciences and Humanities. It scames the contents of nearabout 300 periodicals.

Another landmark in the field of Documentation is "Guide to Indian Periodical Literature"; a very bold step in indexing of Indian periodical literature (Social Sciences and Humanities). It was started in 1964 and published by M/S Prabhn Book Stores, Gurgaon, (Haryona).

INDEX NEWSINDEX, another important publication, was started in 1965 by our Extention Library of the Panjab University at Ludhiana. It is a quarterly subject guide to Select English language newspapers of India. It is a pioneering effort in the field of newspaper indexing in India.

Recently established Indian Council for Social Science Research also plans to establish a Documentation Centre in the field of Social Sciences on the paralled lines to INSDOC, but the efforts are yet to bear fruits.

This was in brief the current efforts of the Indian people in the field of Documentation both in Science, Social Sciences and Humanities. A few words I would like to say about the training facilities in the field of Documentation. Apart from the courses offered at the 25 Depts. of Library Science, the INSDOC, New Delhi and the DRTC, Bangalore, given extension one year training to students who care to specialize in the field of Documentation

CONCLUSION:

In conclusion I would like to say that India is Struggling hard to do her hunble bit in the field of Documentation. Since we have to import machines required in Documentation, we force tremendous difficulties. Besides, sufficient funds one also not available to acquire all the latest reprographic machines and other equipment. But I hope, in yours to come we will be able to import necessary equipment from friendly nation like Japan.

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SCIENTIFIC AND TECHNOLOGICAL DOCUMENTATION IN INDONESIA

by Andrini Martono

Indonesian National Scientific Documentation Center

INTRODUCTION

Scientific and technological documentation is closely related with and depends on the scientific activities in that particular country. The following introduction on scientific activities is necessary to understand the development of scientific documentation in Indonesia. In the post war period there are few Indonesian graduates, and accordingly very few are associated with scientific activities.

After withdrawal of the Dutch scientists, efforts are made to fill the gap of graduates by setting up universities with the limited funds and teaching staff available, and by sending promising students abroad.

Gradually the quantity of young scientists increased to carry on the scientific activities in established research institutes, and new research institutes were founded. But there was a serious lack in research guidance, as there are very few senior research workers, so that scientific ability was still at a low level. Library and documentation facilities are very limited and only very few reference material can be obtained. Not much research results were published, as the scientists are not yet prepared to publish scientific works. Publications are usually in mimeograph form, with limited distribution.

Before the research institutes are able to catch up their optimal scientific load, economic and political conditions during the last decade force them to slow down. Government subsidies for research are limited or non-existend, research institutes must pay their way by manufacturing products for sale or giving regional test and analytic service.

During this survival-period, not much research and development was carried out. There was a serious decline in the level of science and technology, since there was no contact with leading foreign research institutes and very little current technical literature was available.

With the improvement of the economic situation and the beginning of the Indonesian "Five Year Development Plan" in 1969, research activities being important for the progress of development, regain the attention of the government. Research to be carried out are mainly directed toward development of agriculture and industries supporting agriculture. Library and documentation development is included in this plan. Since last year there was a stir in documentation and library activities, in the form of conferences, workshops and training courses in the field of research as well as university libraries.

Existing libraries of research institutes are still very poor in their collection, professional staff is in most cases non-existent.

At the moment documentation and library services in its fully extend must still be introduced in Indonesian research institutes. As a result of poor library conditions in universities, and the absence of guidance in the use of scientific literature, graduates are not aware of the possibilities of good documentation services.

In the same period of scientific library decline in Indonesia; tremendous advancement has been achieved in documentation services throughout the world, so that we are very much behind.

Scientific and technological documentation services worth mentioning are offered at three centers:

1. The Indonesian National Scientific Documentation Center at Djakarta, in the field of science and technology
2. The Bibliotheca Bogoriensis at Bogor, in the field of biology and agriculture
3. The Regional Housing Center at Bandung, in the field of building and building materials

All three are located in West-Java, where most research institutes are located.

THE INDONESIAN NATIONAL DOCUMENTATION CENTER

The Indonesian National Scientific Documentation Center was established in June 1965, developed from the Documentation Section of the Council for Science of Indonesia.

During the first Indonesian National Development Plan for 1961-1968, the Council for Science of Indonesia was entrusted to set up national institutes in various fields of science. It was then felt necessary that a national documentation center should be set up, which could act as clearing center for science information for the institutes of the Council, though its activities should serve on a national level as well. The documentation center is still located in temporary quarters, lack of space is becoming more and more serious. It hopes to move to its permanent building in 1971-1972, which is now being built.

During those five years of age, the Indonesian National Documentation Center, in Indonesian abbreviated to PDIN, has build up the most important facilities for scientific documentation services, to carry on its function as clearing centre for science and technology for the institutes of the Indonesian Institute of Sciences (developed from the Council for Science of Indonesia), other research institutes and individual scientists throughout the country. To meet this demand for scientific informations, the PDIN library has built up a modest collections of basic reference works in many scientific and technical fields. In selecting journals for acquisition, emphasis is placed on abstracting journals and other secondary literature. Whenever possible back volumes are purchased covering at least the last five years or more. About 40% of journal subscriptions are secondary literature. It must be mentioned that 70% of the foreign periodicals are received as gift or exchange.

Reprographic equipment and staff are gradually up-graded, with the guidance of Mr. M.J.F.O'Halloran, UNESCO expert in graphic arts.

The PDIN will supply on request microfilms, microfiches, duplicated and printed copies of scientific or technical materials supplied to the user, at modest cover-charge.

Documentation Services:

Because of the unawareness of most Indonesian scientists of the extent of library and documentation services, the very limited qualified documentation staff members of the PDIN are still able to satisfy the demand in documentation and information services. Users of the services may come to PDIN, or requests may be called in or sent by mail.

The following services are provided:

a. Literature search and bibliography compilation services. The PDIN provide scientists with requested literature search, compilation of list of references on any specific subject

b. Document procurement service
The PDIN will help scientists in locating specified literature and supply copies from its own collection or from other libraries and documentation centers in Indonesia or abroad

c. "Quick Information" Service
The PDIN supplies upon request tables of contents of current journals subscribed by institutes of the Indonesian Institute for Sciences from which scientists can request copies of articles of interest to him.

d. Translation Services
Translations will be undertaken on request into the Indonesian or other specified language, by its own staff or other translators contacted by the PDIN.

The PDIN is compiling a national union catalog of scientific periodicals in scientific institutes and universities in Indonesia to be completed this year. By up-dating this catelog regularly, locating scientific articles will be much easier. Some institutes in Djakarta and Bandung are equiped with reproduction facilities, which will be helpful in obtaining the requested material in reasonable time. Serial catalogs of the Australian National Library, University Libraries in Kualalumpur and Singapore are also available at the PDIN library, which are often used in locating and requesting needed articles.

In some cases communication seems still difficult in spite of close relations through international organizations. Some requests remain unanswered, and must be repeated if one of the PDIN staff members visits that particular country.

Requests for copies of Indonesian articles or specific publications from documentation centers abroad are also handled by the PDIN, mostly in the field of economy and social sciences, medicine and biology.

Documentation Activities

The following activities in scientific documentation are carried out by the PDIN.

a. Index of Indonesian Learned Periodicals

This annual index forms a major task of the PDIN, and is now already in its 9th year. The 1969 issue contains 849 entries, as compared to 813 entries in 1968.

b. Indonesian Abstracts

This quarterly abstract journal is published by the Indonesian Institute of Science, with the assistance of PDIN.

c. Directory of Special Libraries
The second edition of this directory, was published in 1969, it is to be up-dated every other year

d. Terminology of Library science and Documentation
A list of Indonesian Library and Documentation terms was compiled by the PDIN, and is ready to be printed

e. Bibliographies
A bibliography on food was published in advance of the "Workshop on Food" held in Djakarta 1968.

A bibliography on Government reports and reports by foreign experts in Indonesia is in process.

f. Guidance in Documentation
The PDIN is prepared to assist science libraries in planning and operation of their library and documentation services, by advice and practical training. Two courses were held on Library and documentation for library attendants of research institutes.

In compiling the Index of Indonesian Learned Periodicals, it is difficult to obtain all existing learned periodicals. Many of the journals published have ceased publication because of high printing costs. Most scientific publications are in the field of medical sciences and agriculture.

In running library & documentation courses, the PDIN meets some difficulty because of the low level of education of most library attendants of research institutes. It is a problem to obtain government reports and reports of foreign experts and consultants, since the system of distribution is not clear, and are usually in mimeograph form on small quantities.

THE BIBLIOTHECA BOGORIENSIS

This library dates back to 1842, and has the most comprehensive collection in biology and agriculure. In fact, the largest science library in Indonesia, holding 300,000 books, 2,000 titles of journals and 100,000 reprints. It is located in Bogor, center of research activities in biology and agriculture, with its famous Botanical Garden. The Bibliotheca Bogoriensis is coordinating 26 libraries of research institutes in the field of biology and agriculture, and provides practical training for those libraries.

It is now building new quarters to house its overcrowded book stacks, and plans to provide reproduction facilities.

As a center of literature in biology and agriculture it has attracted many foreign institutes, especially on post-war scientific materials.

Documentation Activities

Scientific documentation activities started in 1965 with the compilation of bibliography on Agro-Economy. Since then it has compiled many special subject bibliographies in the field of biology, agriculture and related subjects. The Bibliotheca Bogoriensis is also prepared to compile bibliographies on request.

The following bibliographies were published:

a. Bibliography on Economic Agriculture in Indonesia
Published quarterly by the Documentation Committee of the Agro-Economic Survey, in cooperation with BB.

b. Anotated index on biology and agriculture, bimonthly compiled from the holdings of BB.

c. Index of biology and agriculture in Indonesia, bimonthly

d. Documentation of newspaper clippings, semimonthly

e. Bibliographical series

Special subject bibliographies have been published since 1967, it has reached now 18 numbers, in the field of biology, agriculture and related subjects.

All those bibliographies are published in mimeograph form.

The Bibliotheca Bogoriensis has also published a revision of the Geographical UDC Classification on Indonesia and a Directory of institutes and government agencies related to the fields of biology and agriculture.

Documentation Services

In providing documentation services the Bibliotheca Bogoriensis makes use of the reproduction facilities of the National Biological Institute, since it does not yet have the opportunity to buy reproduction equipment itself.

The following services are provided:

a. Literature search and bibliography compilation services

b. Document procurement service

Scientists are assisted in locating literature from its own library, through a Union Catalog of periodicals in libraries coordinated by the Bibliotheca Bogoriensis or through international relations. This service is also provided for overseas documentation centers.

THE REGIONAL HOUSING CENTRE

This research institutes was established in 1953, and serves the humid tropical area of South East Asia.

It is one of the first research institutes providing modern documentation and information services.

It promotes and assists the establishment of Building Information Centres in Indonesia. One has been erected in Djakarta, and others are being planned in Jogjakarta, Surabaja, Bali,etc.

The library has a comparative small holding (9,000 books, 100 titles of journals) but its publications and documentation services are much appreciated by architects, engineers and students. The Centre has adequate reproduction facilities. The Regional Housing Centre receives assistance from the United Nations and Bouwcentrum, Netherlands, including the development of its documentation service. It coordinates training courses in library and documentation, to promote uniform classification and library administration of libraries of institutes under the Ministry of Public Works and Electric Power.

Documentation Services

The Regional Housing Centre provides document procurement services by locating literature and supplying reproduction copies of needed articles.

Documentation Activities

The following activities are carried out:

a. publication of articles and abstracts on subjects of interest to Indonesia.

b. Documentation of newspaper clippings on building and town planning.

Other fields of science do not possess any documentation service worth mentioning, for example medical sciences and economy. Important libraries in those fields are faculty libraries.

The PDIN has abstracts journals on medical sciences and many physicians are using the documentation services of PDIN.

By conducting library and documentation courses, during which the participants visit important library and documentation centres, they are introduced to sources of materials and get to know each other which is important for better cooperation among library and documentation centers.

The importance of scientific documentation must still be introduced to research institutes and universities in Indonesia.

The problems of scientific documentation in Indonesia thus consist not only of supplying services but also of introducing documentation functions and principles, and attracting people to the profession.

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SCIENTIFIC DOCUMENTATION IN PAKISTAN (NATIONAL REPORT)

by
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Documentation Officer

PANSDOC

The developing nations of Asia are facing the same pressing need for ready access to the over-increasing volume of scientific and technical information which the more advanced industrial communities elseqhere are experiencing. It is because our countries too are caught in the un-precedented world-wide upsurge of research and development activities which is taking place in our time.

The problem for us is no less, if not more, acute. For, while the task of organizing the bulk of the information output is being tackled by the countries which mainly produce them; for us the problems of information transfer assume an added dimension, because physical distance and various other barriers impede the flow of information between the sources and the users. The enormity of resources, which would be required to build up any self-sufficient, or even nearly self-sufficient store of information, makes it impracticable for individual countries of this region to attempt any such project alone. There is therefore an imperative need for the pooling of resources among the countries of this area, as well as with the rest of the world.

In Pakistan, we are faced with the vital task of economic development through the implementation of a series of five year plans. This calls for the development of new industries, improvement of agriculture, fisheries, communication, housing, public health, and social services, etc. These represent problems which need systematic investigation by our scientists for their solution. The Government have therefore actively promoted research and development activities in the country. As a result a large number of research organizations have been established all-over the country.

The over-all responsibility for the formulation of research and development policies and their execution rests with the Division of Scientific and Technical Research under the Ministry of Education and Scientific Research of the Central Government. To advise the Ministry in all relevant matters and to coordinate the activities of the various research/organizations in the country is the function of the National Science Council, which consists of both official and non-official members.

Researches are carried out mainly under six autonomous organization namely: (i) the Council of Scientific and Industrial Research, (ii) the Atomic Energy Commission, (iii) the Agricultural Research Council, (iv) the Medical Research Council, (v) the Irrigation and Flood Control Research Council, (vi) Housing and Work Research Council. These organizations maintain a large number of research laboratories all over the country.

Certain amount of researches are also carried out in the scientifically oriented government departments concerned with such diverse activities as geological survey, zoological survey, water and power development, agriculture, forestry, fisheries, horticulture, public health, education, industrial development, mining, meteorology, telecommunication, etc. Some of these departments have established laboratories which are active in many fields of research.

Researches, mainly of fundamental nature, are carried out in the 12 Universities and 15 medical colleges and their attached hospitals.

A large number of industries of every kind have developed in recent years as a result of governmental efforts for the industrialization of the country. Their requirement of industrial and technical information is increasing rapidly.

Scientific documentation received the attention of the Government of Pakistan as early as 1955 when the Ministry of Education approached Unesco for assistance in the organization of documentation services in the country. A Unesco expert accordingly came to Pakistan in January 1956 to study the situation and to advise the Government in this respect. In early 1957, the Pakistan National Scientific and Technical Documentation Centre (PANSDOC) was established in Karachi as a Unesco aided project, under the administrative control of the Pakistan Council of Scientific and Industrial Research (PCSIR), which was then the premier research organization in the country.

Two regional centres of Pansdoc were established in Dacca and Lahore in 1963 and 1964 respectively, with a view to make available the resources of those two important seats of learning to the Users of Pansdoc Services.

PANSDOC SERVICES:

Pansdoc functions as a clearing house or an agency for scientific literature and information. It has no library of its own, except for a collection of reference sources and indexing and abstracting journals. The resources of libraries attached to the scientific and technical institutions in Pakistan, starting practically from nil in most cases at the time of creation of Pakistan in 1947, has not developed adequately enough. Pansdoc is therefore called upon to fill this gap through its document procurement service. The measure of its success can be judged from the fact that since the starting of this service in 1957, over 45,000 individual items of literature have been procured by Pansdoc, about 80% of these from foreign sources. Nearly 10,000 items are being ordered every year at the current rate. The details of Pansdoc services are as follows:-

i) DOCUMENT PROCUREMENT SERVICE: Under this service Pansdoc provides hard copies of documents against specific requests. Every effort in made to do this as quickly as possible. Still considerable delay is unavoidably involved due to the necessity of foreign procurement in about 80% of the cases. In a few cases, the centre is unable to supply the desired document mostly because of incorrect or insufficient bibliographical reference provided by the requester.

The Centre has, till the end of 1969, received 26,609 requests for photocopies, 18,484 for microfilms, against which 351,908 pages of photocopies, and 564,691 pages of microfilms have been supplied.

ii) BIBLIOGRAPHY COMPILATION SERVICE: Bibliographies are compiled on request, usually running a few tens of references to a few hundreds, on highly specific topics. The number of these requests till the end of 1969 came to 1,087, against which a total of 36,959 reference citations were provided.

In addition to demand bibliographies, the Centre also compiles bibliographies on topics of special national interest. These include bibliographies on such topics as soil erosion, salinity, flood control, utilization of waste products, mango diseases, rauwolfia, etc, to name only the important ones. A cumulative list of bibliographies compiled by the centre has been published, and is being kept up to date.

iii) TRANSLATION SERVICE: The Centre endeavours to provide translations on request from all major languages into English. Translations are mostly requested from German, French, Russian, Japanese and other European languages.

Till the end of 1969, the Centre has received requests for 2,259 translations, against which approximately 2,496,885 words of translations have been supplied. Most of these have been done by the Centre's staff of translators. A lesser portion was however done by part-time translators, whose works are edited in the Centre before being supplied to the requester. Due to lack of adequeate number of good translators in the country, the Centre is facing difficulty in meeting the demand for this service.

A consolidated list of translations has been published by the Centre in 1968. This will be kept up to date by publishing annual supplements.

iv) DOCUMENT REPRODUCTION SERVICE: The Centre is equipped with a whole range of microfilming, photostat, enlarging, offset printing and binding machines, housed in an air conditioned building. In addition to reproduction of documents against requests received in the centre, the Document Reproduction Section prints the Pakistan Science Abstracts, the PCSIR News, as well as other publications of PANSDOC, PCSIR, NSC and other outside agencies. The printing jobs handled by this section amounted to 4,278,496 impressions till the end of 1969.

v) ABSTRACTING SERVICE: Since 1961, Pansdoc has been publishing the quarterly journal: Pakistan Science Abstracts containing abstracts of papers of research significance appearing in Pakistani periodicals. The Centre does not prepare abstracts on request.

OTHER PUBLICATIONS OF THE CENTRE: The Centre prepared in 1968 a directory of current scientific projects in Pakistan, containing nearly 3,000 entries. This has been published by the National Science Council of Pakistan. In 1958, the Centre compiled a directory of scientific institutions and scientists in Pakistan, which was published by the Unesco South Asia Science Cooperation Office, New Delhi. This is now being revised in the Centre.

A union catalogue of scientific and technical periodicals in the libraries of Pakistan, containing about 5,000 serial entries, has been published this year. A bibliography of medicinal plants of the CENTO countries is new being compiled in the Centre, under a grant from the CENTO.

MECHANIZED PROCESSING OF INFORMATION:

Since 1969, an ICL Data Processing System, based on 80 column IBM punched cards, has been in operation at Pansdoc. This is currently being used for the preparation of author and subject indexes of the abstract journal of the Centre. The alphabetic arrangement of the Union Catalogue (mentioned earlier) and the preparation of its final copy for the press was accomplished with this system in one operation. A catalogue of the microfilm holdings of Pansdoc is being processed now.

Pansdoc is now planning to start very soon an information transfer service in the form of bulletins, and possibly some variation of selective dissemination of information, with the help of this mechanized system. As a first step, preliminary data regarding interest profiles of various groups and individual scientists are already being compiled.

FUTURE PLANS:

Pansdoc services so far have been responsive in nature. These have been intended to bridge the gap caused by a very serious lack of library resources in the country. We are quite aware of the fact that this does not meet the full requirement of the scientists, who in many cases are not aware of significant items of information even in their fields of specialization, because of the tremendous increase in the volume of literature. Pansdoc has, therefore, prepared a plan for initiating an information transfer service to be based on the resources of the libraries which are proposed to be established at the premises of Pansdoc in Karachi and Dacca. And in addition to the existing centres of Pansdoc in Karachi, Dacca, and Lahore, four more regional centres are proposed to be opened at Peshawar and Hyderabad in West Pakistan, and at Chittagong and Rajshahi in East Pakistan. These centres will form a national network of information transfer system to serve the increasing requirements of research and development activities during the Fourth Five Year Plan initiated on 1st July, 1970.

DOCUMENTATION ACTIVITIES OUTSIDE PANSDOC:

A few organizations, besides Pansdoc, have organized scientific information cells in their laboratories. These are, to name the most important ones, the Atomic Energy Commission (PAEC), the Jinnah Postgraduate Medical Centre in Karachi, the Defence Science Organization, and the Council of Scientific and Industrial Research.

The PAEC centres in Lahore, Islamabad and Dacca have large collections of microfiche received from the IAEA and other national organizations abroad. The information cell at the Pakistan Institute of Nuclear Science and Technology (PINSTECH) at Islamabad has now been designated National Liaison Office in Pakistan for INIS (sponsored by IAEA). Under this arrangement, they will receive microfiche copies of all conventional and non-conventional literature appearing in INIS indexes.

Honorable mention must also be made of two learned societies active in the field of scientific documentation. One of these in the Pakistan Bibliographical Working Group which was formed in 1950 and reorganized in 1953. It has already brought out several publications. It has compiled the Retrospective National Bibliography of Pakistan, 1947-61 for the National Book Centre. It is at present conducting a six months diploma course for special libraries.

The other is the Pakistan Association of Special Libraries (PASLIB) which has been formed only recently, and is still at an early stage of organization. It is already publishing a monthly news letter on Special Library activities in the country.

TRAINING IN DOCUMENTATION:

Although there is no full time course available on scientific documentation, the subject is taught as a part of the library science courses at postgraduate level in the universities of Karachi, Lahore and Dacca; and Pansdoc is participating in co-operative teaching of scientific documentation under an arrangement with the university of Karachi.

Pansdoc also offers its facilities to other organizations, within the country and abroad, for the training of documentalists. Under this programme, the Centre has trained personnel from the Geological Survey of Pakistan, the Dacca University, the Defence Science Organization, the Central Cotton Committee, etc. as well as a documentalist from the TNDC, Bangkok.

INTERNATIONAL CO-OPERATION:

A documentation centre cannot function effectively without international co-operation, Conscious of this fact, Pansdoc has offered active co-operation to other centres all over the world, and to the centres of our neighbouring region in particular.

With the centres in Iran and Turkey, Pansdoc has established a special relation under the programme of Regional Co-operation for Development (RCD). A conference of the heads of the three documentation centres (PANSDOC, IRANDOC & TURDOC) took place in Teheran on 9th April, 1970, to consider various aspects of this co-operation. The Director of Pansdoc visited Iran in 1969, under the auspices of UNESCO, to advise that country on the organization of documentation services.

Under another arrangement between Zambia and Pakistan, the Director of Pansdoc visited Zambia on an advisary mission to help that country in establishing a documentation centre.

Pansdoc has recently offered training facilities to Indonesia under the auspices of the Indonesia Pakistan Economic Co-operation Programme.

While there is no doubt that facilities for advanced training in the field of scientific documentation is available in western countries, Pansdoc could modestly offer its training facilities which are more suited to the local conditions in South and South East Asia.

Pansdoc looks forward to more fruitful co-operation among the countries of Asia in the field of scientific documentation. It will wholeheartedly support any course of action directed towards this end.

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REPROGRAPHIC SERVICES OF PANSDOC IN PAKISTAN

by Sanaul Haq

INTRODUCTION

Scientific documentation services in Pakistan were introduced in 1957 when the Pakistan National Scientific and Technical Documentation Centre (PANSDOC) was established under the administrative control of the Council of Scientific and Industrial Research (PCSIR) with technical assistance from UNESCO.

The assistance provided by Unesco was in the form of services of experts, who helped in organizing the services of Pansdoc, as well as reprographic equipment and training facilities. Of these, the reprographic equipment constituted the largest share. As a result, the Reprographic Section of Pansdoc started functioning almost immediately after the establishment of Pansdoc.

PANSDOC SERVICES: In the scheme of Pansdoc services, photoreproduction occupied a very important part, because of the fact that most of the requests for Pansdoc services are for hard copies of documents in either microfilm or photocopy form. Photographic prints are prepared from the microfilms received from foreign sources against specific requests of the scientists. It is found from experience that most of the scientists prefer photocopies, because it is easily readable without the use of any special optical aid. The demand for the photo reproduction service of Pansdoc can be judged from the fact that till the end of 1969, a total of 564,691 pages of microfilms and 351,908 pages of photocopies have been provided against specific requests.

At a late stage, in 1962, offset printing equipment were installed in Pansdoc to make up a complete line of reprographic facilities available for its services. With this, choice of several processes is now available to suit the economy of process and the number of reproduction required. Till the end of 1969, a total of 42,785 standard pages containg 30 lines per page have been printed. The Reprographic facilities in Pansdoc have been organized in the following lines:

(A) MICROFILMING AND PHOTOCOPYING:

The processes involved in this section is mainly microfilming, its processing, duplication of microfilms, photoprints from the microfilm and direct photocopies from the flat originals or bound volumes.

(i) MICROFILMING: The process selected for microfilming is only 35mm size, as this is the most convenient size for our needs. At present we have selected recordak 35mm Model AH5 Cameras, Supplied by M/s Kodak Ltd. Recordak Div. of London. These are rigidly built, easy to operate and foolproof cameras, except that the photo-electric cell of the camera is mostly damaged in the tropics. In all the cameras, whereever they have been installed, the general complaint received was the malfunctioning of the exposuremeter of the camera, with the exception of the MRD2 Model.

(ii) MICROFILM PROCESSING: For bulk processing the centre is equipped with an OSCAR Fisher Continuous Day-light Processor for 35mm and 16mm perforated and un-perforated microfilm. It is a fool proof machine, but needs a skilled operator. Production is very high. In addition to this machine, for short run microfilms, Kodak Spiral 35mm Processor Model 100, along with dryer is used, and it serves the purpose of stand by unit in case of breakdown of the bulk processor. This is a simple processor but care has to be taken while loading film on the rack. This is a dark room operation.

The microfilms supplied by Pansdoc are mostly in the form of 10 inch strips, containing a maximum of 10 pages. This form has been found convenient for filing and handling, as well as for mailing by post.

(iii) PHOTOCOPYING: Reflex contact printing and similar process have been avoided in the Head Office at Karachi, considering the high work-load, high speed of operation required. Photostat 10/14 Photo Copier has been selected instead because of its advantages over the other processes.

In Reflex printing the limitation of size and the speed is the biggest handicap; whereas the photostat is easy to operate by unskilled staff. Reduction and Enlargement are possible on direct readable negative form. Additional features of the machine are that once it is set you get the direct copy ready for use. Roll of sensitized paper is fed into the machine and is automatically cut to the pre-selected size. Considerable saving, upto as much as 50%, is obtained in this machine compared to the cost of the Reflex printing methods. This machine can be used for making photocopies of reasonable quality, either from microfilm strips or from aperture cards. The production speed of the machine is 600 prints per hour.

In the Regional Centre at Dacca and Lahore the reflex printing is being used as the work load is rather less than at Karachi Centre.

Microfilm duplication service is also available at Karachi Centre. For this purpose the centre is equipped with a small Lumoprint 35/16mm duplicator.

(B) OFFSET PRINTING

In this process the image is planographic, that is neither in relief nor recessed, and the base is flexible metal sheet, usually of zinc or aluminium, which is applied to a cylinder for rotary printing. This is the quickest, cheapest and the most efficient method. This gives a perfect image and the plate requires no "make ready" on the machine.

Illustrations, both line and half tone, are incorporated in the text and printed in single operation. At present Pansdoc has adopted this system of printing, and the main features of the process can be grouped as follows:

(a) Copy preparation

(b) Type Setting

(c) Art and Make-up

(d) Process Camera

(e) Place Making

(f) Machine

(g) Binding

(a) COPY PREPARATION: Is the most important features and it should make a clean, position and with out confusion to the mind of the type setting section.

(b) TYPE SETTING: Our basic needs fall into two categories of printing:

(i) Printing of Reports & Proceedings which are typical book work with main body face and isolated titles.

(ii) Abstracts which combines several type faces.

The equipment used for type setting are Varityper and Head Liner, and IBM Writer. These machines are simple to operate with a little training by an office typist, gives reasonably good speed. But there are the maintenance problems in the developing countries. Varityper gives the justified column of the desired width.

(c) ART AND PAGE MAKING UP: Both art work and composed matter of Varityper and Headliner are assembled in this operation. Corrections are also made and the final copy is ready for Process Camera to be photographed. This Section is equipped with NuArc Jet Line line-up table supplied by NuArc Co. Inc., Chicago, U.S.A.

(d) PROCESS CAMERA: This section is equipped with a Robertson 840 gallery type camera. It is a very efficient piece of equipment, which has all the essential features of meeting our present requirements, such as line and halftone work. The Dark room is equipped with a temperature controlled sink supplied by Oscar & Fisher and a sheet film processing tank.

(e) PLATE MAKING: The process adopted in plate making is aimed to ensure good and uniform quality under all conditions of operation. This process involves simplest technique for plate making, minium use of chemicals and equipment. For these, presensitized plates are the answer. But the limitation of shelf life is the only short-coming of this process. We are therefore using metal plates, which are a little expensive, but have indefinite shelf life. This section is at present equipped with a Lumoprint Whirler which is not sophisticated in appearance but is quite satisfactory. In addition we have a NuArc Flip-top Plate Maker, Model FT26, 25 x 27 ins, supplied by NuArc. Co., USA. This machine has all the good features except that it discharges smoke and heat produced by the Arc lamps.

(f) PRINTING MACHINE: We have installed Romyor I and II machines, which are quite satisfactory, except for the feeding troubles due to the inferior quality of the compressor and certain other parts. Break down is consequently greater in comparison to other similar machines, like Rota Print 30/90. Impression cylinder adjustment are crude or rather old fashioned. It can take either a simple brief plate or two foolscape plates side by side. Registration is good, Revolution speed is about 5,000 impressions an hour, but actual output is 2,000 - 2,500 an hour.

(g) BINDRY: The Unit can be divided in to three processes:

(1) Preparatory

(2) Paper back

(3) Library Binding

(1) PREPARATORY: In this, printed matter is transferred from the machine, and all preliminary preparations are made such as : creasing of covers, folding of pamphlets, journals and small scientific reports. The machines used are modern in appearance and efficiency. Since the installation we did not face any difficulty in operation and maintenance. The processes involved are, folding, creasing, drilling, collating, etc.

(2) PAPER BACK: This unit includes stitching and completion of paper backs.

(3) LIBRARY BINDING: This unit is one of hand operation, with simple bench operation tools. Handling skill and know how of the operator is very important.

WORK UNDERTAKEN BY THE PRINTING SECTION:

As mentioned earlier, this section started working in 1962. Since then, it has undertaken the printing of all the publications of Pansdoc, including the quarterly abstract journal: Pakistan Science Abstracts, and the Union Catalogue of Scientific and Technical Periodicals in the Libraries of Pakistan (1970). It also includes most of the publications of the Pakistan Council of Scientific and Industrial Research, the Pakistan Atomic Energy Commission, the National Science Council, the University of Karachi and other outside agencies. Currently, it is undertaking the printing of a Glossary of Zambian Medicinal Plants for the National Council for Scientific Research, Zambia. It is the policy of the centre to accept outside printing jobs whenever there is spare capacity in the Press Section.

FACILITIES AT THE REGIONAL CENTRES:

The two regional centres of Pansdoc at Dacca and Lahore have their own photo-reproduction facilities. The centre at Lahore is equipped with a Kodak Processing Tank, Model 100 for 35mm film and special dryer, Model 100, as well as a Duostat Reflex Copier.

The Dacca Centre has the same equipment as Lahore. In addition, it has already acquired a complete unit of offset printing equipment. This will start functioning very soon.

STAFF:

Pansdoc has a full complement of highly trained staff in its Reprography Division. Most of the senior members of the staff have had their training abroad under the Unesco and the Colombo Plan Fellowship Programmes, in U.K. Germany, Belgium and Czechoslovakia. One member of the staff is presently undergoing training at the London School of Printing and Graphic Arts under a Colombo Plan Fellowship.

PHOTO-REPRODUCTION FACILITIES OUTSIDE PANSDOC

A few organizations outside Pansdoc have installed microfilming and photo copying facilities mostly for the members of their staff. These include, the Jinnah Post gradual Medical Centre, the Karachi University, the State Bank of Pakistan, the Department of Archaeology, the Central Bureau of Education, all in Karachi: the Atomic Energy Centres, the Punjab University, the Dacca University, the Defence Science Organization, the Geological Survey of Pakistan, etc. In most of these cases, Pansdoc has provided advisory services for the installation of reproduction facilities.

TRAINING FACILITIES:

The Reprographic Division of Pansdoc is now fully equipped and staffed to impart on the job training in various techniques of reprography. They have already trained a number technicians for several organizations mentioned above, as well as one officer of the TNDC, Bangkok. Pansdoc is willing to co-operate with other documentation centre in the countries of our neighbouring region in the organization of reproduction facilities on proper lines, and in the training of their technical staff.

Distribution: limited

DOCTEC/2/Philippines
Tokyo, 15 July 1970

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo 20 July - 21 August 1970

REPORT ON THE ACTIVITIES IN THE FIELD OF SCIENTIFIC AND TECHNOLOGICAL DOCUMENTATION IN THE PHILIPPINES

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Introduction

Almost all human activities and endeavors require reliable documentation, one way or the other. No laboratory, factory, large commercial concern or newspaper office; no scientific institute or governmental bureau can really do without it. The process of documentation is to make available the knowledge, ideas or principles for purposes of implementing a research programme. Before initiating a research programme, first of all the goals must be established. Proper planning and critical analysis is needed to attain a well-defined goal from a multitude of possibilities. In doing research work, it is necessary to illuminate the unexplored situation by means of knowledge, which then are made available by documentation. Documentation consists of efficient handling of information, especially the storing and retrieval of materials (books, documents, periodicals, newspapers, technical, scientific and company reports, pamphlets, patents, etc.), as well as maps, films, slides, recordings, clippings, prints, photographs, etc. It also includes foresight and vision in what will be the needs of the country in the future. Research without documentation will undoubtly result to waste of manpower, time, equipment, and materials and money simply because necessary information is achieved only by means of documentation. Philippine scholars, scientists, technologists, historians and students could be well served with the results of documentation work.

Role and Activities

The National Institute of Science and Technology

The National Institute of Science and Technology is one of the Scientific and Technical Documentation Centres in the Philippines organized with UNESCO assistance. It is the largest centralized government-owned repository of reference materials, books, periodicals, journals and other information media concerning all branches of science and technology. The Institute, through its Documentation Division, assumes the role and performs the functions of a national science library and documentation centre in the Philippines. It is responsible for the discharge of this function by building up a dynamic collection of scientific and technical reference materials capable for serving not only as a rich source of information for the staff of the institute or for the scientists, engineers, technologists of our country, but also as a background to its documentation work - a tool necessary for the proper conduct of research and studies. As an integral part of the National Institute of Science and Technology, the division's interest is to satisfy the immediate information requirements of the staff of the institute, the National Science Development Board (NSDB), the Philippine Atomic Energy Commission (PAEC), and no less important of course - provide information needs, in so far as discernable, of the general public in matters pertaining to science and technology.

In order to provide for the present and potential needs for scientific information of the staff of the National Institute of Science and Technology (NIST), it stresses more in the development of its stock collection, by acquiring publications and materials in the field of special interest to the institute. Materials containing the latest informatôn on scientific and technological development and progress are being acquired so as to meet the demands of the nature of the work of the institute. Publications dealing with social sciences and humanities are also available although they are maintained only as a token file built slowly over the years from the accumulation of assorted gifts and exchanges.

The Documentation Division has an approximate collection of 500,000 - 700,000 pieces of journals and other publications, pamphlets, scientific, technical and research reports and numerous bound volumes, housed in 94 steel bookshelves. It is provided with 19,975 linear feet of shelving space for its collections. At present, it is still in the process of acquiring library materials containing information on scientific and technological developments. It is also gathering data which they believe will best suit to the needs and interests of the researchers.

The division's activities are concentrated on the library and documentation services. The library service is the passive service part of the division. It deals with the acquisition of scientific and technological materials, processing and organizing these materials in such a way as to get any desired information quickly and accurately. The document service on the other hand, is the active part of the division. It is concerned with determining the needs for information and seeking ways and means to make the information and information-seeker inter-act so as to stimulate the latter to search for other information essential to his needs. The division has, eversince, been resorting to the time-honored method - exchange - of building the collection of the library to supplement the meager-paid subscriptions. Among its collection, the following have been acquired through subscriptions - 437 titles; through exchange - 1,600 titles; and through gifts - 967 titles. Soliciting publications exchanges with local and foreign libraries, societies and organizations has been directed with more attention. It has fairly large lists of foreign publications which has been accumulated primarily through the series of special efforts of expanding exchange relations. It has been able to utilize as exchange media "The Philippine Journal of Science" and the monograph published by the National Institute of Science and Technology (NIST) in proposing exchanges. The publications of the division itself greatly help in enlarging its exchange network. The Philippine Abstracts, since its was launched in 1960, has already found wide distribution and, as exchange material, is being sent to 193 entities in 41 countries over the world as well as 57 local establishments. From these exchange relationships, for the Philippine Abstracts alone, more than 355 titles are being received. The Philippine Abstracts is now in its 9th volume, and is a quarterly classified summary of the latest Philippine publications in the field of science and its application. Each issue of the abstract appears in summaries of Philippine scientific papers covered by "class 5" and "class 6" of the UDC scheme. Aside from this abstract, the division (documentation) also currently issues the Philippine Science Index, published at regular intervals, and which is based on the file of the Index to Philippine Scientific and Technological Periodicals. The latter index is accessible to the public and is kept up to date. The division also issues directories and bibliographic lists. So far, it has published a 723-page bibliographical handbook of 102 living men and women engaged in the field of science and technology, entitled "Philippine Men of Science".

The division extends its facilities and services to other sectors of the scientific community, technologists, specialists, science students and many others directly engaged in related fields of study. By special arrangement personnel of other government agencies, private (industrial or educational) establishments may be served on interlibrary loan basis through the library of the aforementioned agencies. It conducts literature searchers and bibliographic checking and locating reference materials for all its patrons. It compiles bibliographies, releases bulletins of contents of selected periodicals, annotates lists of books received by the library and other aid to reference searching. Photocopies, xerox reproductions, microfilms, photoprint enlargements of articles found in periodicals or part of books in its collection are provided to its readers on payment of the cost of materials. All requests for document reproduction are made in writing or on prescribed forms provided by the division.

The reading room is open to the public Monday through Friday from 8 a.m. to 12 noon and from 1 - 5 p.m. During summer session, it is open Monday through Friday, from 7:30 a.m. to 12:30 p.m. and 1:30 - 4 p.m. The library is closed on Saturdays, Sundays and Holidays.

It uses the Universal Dewey Classification and the Library of Congress in the arrangement of its collection, and Kardex for retrieving information. It has also trained a number of its staff and librarians from government libraries, in a special training course which was conducted by a certain Mr. Walter Lorch, a UNESCO documentation specialist.

The Bureau of Records Management (National Archives)

Introduction

Although the NIST solely contributes to the scientific and technological development and progress of our country; the BRM (National Archives) also contributes to its development and progress in another field of advancement, that is, the preservation of the cultural heritage of the nation. At the opening of the Seventh Congress of the Republic of the Philippines last year, (Jan. 27, 1969), President Marcos in his State of the National Address, cited among other things, the work that this particular bureau has done during the past years, to wit: "Our archival materials, now safely housed in the National Library, are being processed, catalogued and microfilmed for the use of scholars and researchers. This serves a long-felt need of Filipino scholarship."

Role and Activities

The BRM is charged with the task of planning, developing and coordinating government-wide programmes, policies, rules and regulations governing the use, storage, preservation and disposition of current records, noncurrent records, and records of permanent and historical value. It is the repository of all government records past and present, not only for ready reference of present and future administrators, lawmakers, justice-dispensers, and the public at large but also of present and future scholars, local and foreign. Togehter with the current records of the government, the Bureau of Records Management is the official guardian of the irreplaceable archival treasures (11-13 million of original documents) bequeathed by the colonial governments who ruled this country for four centuries, many of the documents dating as far back as 1590. The largest archival collection in the Philippines or its enormous treasure is entrusted in the care of this office. It has a big task to perform, that of preserving for posterity and servicing the documents for use of the interested parties, and also the task of facilitating the work of researchers in matters of documentation. The cream of the holdings of the bureau are Spanish records, some of which are dated as early as 1590 and are mostly written in archaic Spanish manuscripts. About 20,000 bundles (at an average of 1,500 pages per bundle) arranged in topical organization are now in steel shelves and properly labeled. In addition, the bureau has around 300-450 bound volumes of document which all together, add up to an approximate total of 25-30 million pages. The bound volumes are xerox copies which pertains to Cedularios, Terrenos, Informacion Posesoria, etc. The Cedulario is a collection of royal orders from the King of Spain. The Terrenos are collection of documents pertaining to land, land disputes and settlements and other land cases. Informacion posesoria is a sub-collection of the aforecited documents. These documents, however, do not mean anything unless they are systematically organized and made available and manageable to bona-fide scholars by means of catalogues and finding aides. Since the incumbency of our dynamic and capable director, Dr. Domingo Abella, a foremost historian in his own right, three years ago, a vigorous campaign towards this end has been initiated. Catalogue cards for every document have been produced since then in an ever-increasing number by qualified, trained contractual employees. Bundles and bundles of documents are pried open and documents are individually read (many of them for the first time in centuries) for cataloguing purposes, and documentary materials unknown to the scholarly world are being uncovered. These documents shed new light not only upon the past of the Filipino people, but upon conditions and problems of historical significance to the peoples outside of our shores. These unique, valuable documents are being discovered in undertaking the cataloguing process. Approximately, over a million catalogue cards representing 2 million pages of documents have so far been produced and are filed in card cabinets (steel) by subjects with the corresponding period covered. This continuing cataloguing work on the voluminous historical documents will take many years to finish.

Simultaneous with the cataloguing process, conservation of archival materials have been undertaken, that of microfilming. Director Abella has successfully secured the assistance of the UNESCO which loaned to the bureau the services of Prof. Ramanujam Chari, a reprography consultant, for 6 months (1968-69) at no cost to the government. Mr. Chari had not only trained a group of employees in the techniques of microfilming but he actually microfilmed 1,500 pieces of document which now constitute the nucleus of the bureau's microfilm collection. He also conducted a formal training course in reprography for a select group of employees of the bureau. In addition, the Bureau of Records Management is also undertaking a continuous processing of current general records maintained in an area about 300 sq. m. and filed in wooden shelves (open & closed) by subject, geographical, alphabetic and chronological arrangement.

In carrying out its functions, the bureau plays various roles. It acts as consultant and advisor to government agencies and corporations on matters relating to the creation, maintenance, control, retention and disposal of government records. It also serves as a training center for records officers and other personnel directly involved in records work. In the training aspect, the bureau advices and assists training officers in planning and conducting seminars or in-service training on records management offered to officials and employees of their respective agencies. It recommends topics for discussion in these seminars with the end in view of solving existing records management problems in different government agencies.

The bureau has a plan to conduct in the near future a professional training in Archivology for career archivists. Two curricula have been prepared in this regard, one for in-service training of government-employees and another for career archivists.

As a service agency, the bureau makes available to the public records of information derived from the documents in its custody. The research room is open for research prupses from 8:30 a.m. to 12 noon and 1:30 to 4:30 p.m. on Mondays to Fridays; except Saturdays, Sundays and public holidays.

Reproduction of records may be made for officials and others who have legitimate reason to be furnished with such a reproduction. The National Archives is equipped with a minolta-fax machine, microfilm camera, a negative photostatic machine and a small bindery.

The Bureau of Records Management has its own magazine called "Archiviniana" which is a quarterly publication, as a supplement of the Department of General Services' Review. Its title is coined by no other than the director himself who is the founder of the magazine. According to him, it is taken from the words "archives" and "iana". The latter means, according to Webster's New International Dictionary, "a suffix added to proper names, usually of persons or places, to form nouns denoting items of bibliography, anecdotes, library gossips, or other facts or pieces of information concerning the designated subject, as in Americana, Johnsoniana..." As the term implies, therefore, the "Archiviniana" is intended for publication of facts and pieces of information about the Archives - specifically our National Archives.

Moreover, the Bureau of Records Management (National Archives) is a bonafide member of the International Council of Archives.

Conclusion:

In line with the tremendous stride being made by men in the field of science and technology, the Documentation Center of the Philippines, represented by the Documentation Division of the National Science and Technology Institute, is leaving no stone unturned to keep pace with the modern trends. The Institute is trying its best to keep abreast with the novel ideas and techniques for the upliftment and betterment of science and technology in our country. Inspite of limitations and handicaps, it is determined to move forward in all directions, to attain its goal and, in so doing, there is really good prospect in the field of documentation.

Likewise, the National Archives of the Philippines, which is the central repository of our cherished cultural heritage, is also contributing significantly to the important task of nation-building because through its priceless documents or archival holdings the spirit of nationalism and sense of value of the Filipino people have been preserved.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

REPORT ON THE SCIENTIFIC AND TECHNICAL INFORMATION ACTIVITIES IN SINGAPORE

Mrs. Lock Thi Xuan,
Assistant Librarian, Singapore Polytechnic Library

Introduction

Over the fast few years Singapore has achieved rapid industrial growth. The realization of the importance of science and technology has greatly accelerated the activities in this field. Industry works in close cooperation with the Government especially in research and development, in standardization, and in the training of technical personnel. At present government agencies and statutory bodies provide trade and research information to the new industries. These bodies are the Singapore Institute of Standards Research, the Economic Development Board, Institutions of higher learning, the Science Council and other independent organizations. As industrialization gathers momentum, we are faced with the problem of providing trained technical personnel to serve our new industries. To overcome this acute shortage of skilled technical personnel, the Technical Education Department of the Ministry of Education is actively engaged in conducting training courses.

Research Organizations

The Science Council in the Ministry of Technology was established by an Act of Parliament in July 1967. The function of the Council is to make reports and recommendations to the Minister on:

a) scientific and technological research and development.

b) the effective training and utilization of scientific manpower in Singapore, and

c) the establishment of official relations with other scientific organizations.

The council coordinates the activities of the different scientific bodies to avoid duplication of research in the fields of science and technology.

Singapore Institute of Standards and Industrial Research (SISIR)

The role of and function of SISIR is -

a) to provide testing and laboratory services for industry.

b) to investigate scientific, technological and standardization problems arising from industry.

c) to advise manufacturers on the quality improvement of their products.

d) to provide information services on industrial standards and current technological developments.

e) to issue quality certificates to local manufacturers.

f) to prepare and promote the use of industrial standards in relation to commodities, processes and practices.

g) to carry out research on industrial uses of local materials and the utilization of waste products.

SISIR deals with technical problems relating to mechanical, civil and electrical engineering, chemical engineering, metallurgy, paint technology, physical standards and industrial standardization. the SISIR library is important for its comprehensive collection of standards of many industrial countries.

Light Industry Services (LIS)

The Light Industry Sciences concentrates on providing services to small and medium industries in Singapore. The LIS works in close cooperation with the Singapore Institute of Standards Research and the Engineeing Industries Development Agency of the Economic Development Board. It refers to SISIR the problems which relate to production techniques, testing of raw materials and finished goods, instrument repairs and calibration. Problems which are related to the training of technical personnel are referred to the Engineering Industries Development Agency.

National Productivity Centre

The Centre provides a technical advisory and consultancy services in the areas of industrial engineering, general management and supervisory training, and worker's education. It also conducts training courses for middle-management and trade union officials in certain fields of industrial relations and industrial engineering.

Engineering Industries Development Agency (EIDA)

The EIDA was formed in 1968 and comprises six component units:-

a) Metal Industries Development Centre

b) Prototype Production and Training Centre

c) Precision Engineering Development Centre

d) Woodworking Industries Training Centre.

e) Chemical Industries Training Centre.

f) Electromechanical Training Centre.

The main objective of the various units of the EIDA is to provide the supporting facilities and services necessary for industrial development.

Documentation Activities

The National library received 5 copies of all publications printed or published in Singapore under the Printers and Publishers Ordinance. The publications are registered and listed quarterly in the government Gazette. Offprints of this list are distributed to some national university and research libraries overseas. The national library also issues a "Monthly list of books added to the library", and a list of "Books about Singapore and Malaysia" which appears once in two years.

The library Associations of Singapore and Malaysia are very active in documenting locally published works. A Joint Standing Committee on Library Cooperation and Bibliographical Services (JSCLCBS) of the two Associations has initrated a number of important bibliographical projects. The JSCLCBS terms of reference are:-

1) To determine priorities in developing national bibliographical services.

2) To stimulate research and bibliographical services and to serve as a clearing house of information about research in progress and completed.

3) To recommend policy and practice in the field of library cooperation with particular reference to a) Union catalogue, b) Interlibrary loans c) Co-operative acquisitions, storage and with drawal.

4) To act as a link with national and international bodies concerned with interlibrary cooperation and bibliographical services.

The important projects of the JSCLCBS are:-

1) Union Catalogue of Scientific and Technical Serials in Malaysian and Singapore Libraries

This catalogue is housed in the Reference Division of the National Library of Singapore. The catalogue was started in 1965, and the staff of the national library began the work of compiling entries on cards in 1966. The catalogue now includes over 2,000 titles held mainly in Singapore libraries. The completion of the Union catalogue would greatly assist scientists and technologists to know what we have in order to make full use of existing resources. To expedite the work of the catalogue it may be necessary to employ a computer or mechanical aids.

2) Singapore and Malaysian National Bibliographies

The JSCLCBS assisted in providing guidelines and recommendations which laid the foundation for the national bibliographies of Singapore and Malaysia.

The first issues of the Singapore and Malaysian National Bibliographies, covering 1967 imprints, were issued in June and Marth 1969, by the Singapore National Library and the Malaysian National Archives respectively. It is proposed to issue cumulated national Bibliographies covering 4 to 5 years at a later stage.

3) Index to Current Malaysian Singapore and Brunei Serials

The two library Associations have decided jointly to produce a periodicals index through the cooperative efforts of their member librarians. The index covers the main articles in 86 locally published periodicals. It is classified broadly by the 17th edition of Dewey, with an alphabetical author, personal and place-name index. The staffs of 17 libraries in Malaysia and Singapore undertake the work of scanning the journals and the preparation of entries. The first issue of the index is confined to periodical titles published during 1967.

4) The JSCLCBS also competies an annual list of bibliographical projects which is published in the joint journal of the two library associations entitled "Perpustakaan"

5) Subcommittee on Microforms (SCOM)

This committee was set up in May 1968 with the following terms of reference:-

a) To look into the question of microfilm resources.

b) To examine the present situation of microfilming programmes.

c) To make recommendations for the coordination of these programmes on a national and international level.

The important project undertaken was the nationalization of newspaper microfilming programmes. All current newspapers published in Singapore will be filmed by the National Library of Singapore. The Arkib Negara Malaysia, Dewan Bahasa dan Pustaka and University of Malaya agreed upon a schedule of priorities for the filming of West Malaysia newspapers.

At the Conference on Southeast Asian Research Materials held at Puntjak, Indonesia, on 21-24 April 1969, the Chairman of CSOM was appointed correspondent for Singapore/Malaysia on microfilming projects and would also serve as liaison amongst the Southeast Asian National Correspondents.

Libraries

The libraries in Singapore can be divided into three groups:

a) Libraries which are attached to teaching institutions.

b) Libraries of government departments and statutory boards.

c) Libraries attached to firms, industries and institutions.

Details of Collection

	Number of Volumes	Number of Journals	1969 Budget Books	Serials	Total
			S$	S$	S$
University of Singapore Library	400,000 (1967/68)	5,000	210,000	193,500	403,500
National Library	400,000 (1968)	2,000	200,000	36,000	291,000 (includes $55,000 for miscellaneous expenditure)
Nanyang University Library	160,000	800			155,000
Singapore polytechnic Library	48,000	900	80,000	43,000	123,000
Teachers' Training College Library	42,000	120			16,500

The above table shows the size of the collection of the five major libraries in Singapore. It may be emphasized that the Singapore Polytechnic library is the only library in Singapore with a specialised collection of scientific and technical books. As it is the leading and most up-to-date library in the technical field, its facilities and reference services are very well used by industry and government departments. It also provides a XEROX copying service.

Conclusion

At the National Conference on Scientific and Technical Cooperation between industries and Government Bodies in Singapore in 1968, members stressed the need for scientific technical library and information services. In pursuance of the recommendation made at this conference, the Singapore government obtained the services of Dr. Hans Bauer, a Unesco expert on Scientific documentation to advise on the setting up of an information and documentation centre to assist the industries. Dr. Bauer has recommended the setting up of a documentation centre in Singapore. The vast and extensive industrialization programme, the strong emphasis on technical education and training, and the inadequate facilities for research and development all indicate how necessary for the Government to take positive steps to implement Dr. Bauer's recommendations Perhaps, with Unesco aid, the setting up of a documentation centre equipped with fraimed documentalists and facilities to provide scientific and technical information may become a reality in the near future.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

THE THAI NATIONAL DOCUMENTATION CENTRE: ITS OPERATION AND PROBLEMS

Chalermvarn Choosup, Suwana Aswa-ampywong

Thai National Documentation Centre

Historical background

The Thai National Documentation Centre was established as a part of the National Research Council in 1961 by the Thai Government with the support of UNESCO. Construction of its building took a total of three years time before it could give service in 1964, when it was transferred to the newly established Applied Scientific Research Corporation of Thailand.

Objectives and functions

The Centre's object is to supply scientific and technical information for research work to any scientific or technical individual or organization in Thailand, whether government or private, university or industrial, in any of the subject field in which the Centre has information or has means of obtaining it. First priority is given to subjects in applied science since research in this field is advantageous to the economic development of the country.

Activities

On request, the Centre will compile a list of reference to published papers on any specific topic, and will obtain and supply to the user a microfilm or photocopy of any specified document. Some of the services are provided free of charge, as a part of the government's efforts to stimulate and encourage the use of science in the development of the country. For other services a small flat-rate charge is made; these charges are actually much less than the cost of providing the particular service, and are intended only as "stopping charges" to discourage thoughtless people from asking the Centre to undertake work when it is not really necessary.

The Centre will undertake, on request, the translation into English or Thai of any scientific or technical paper written in another language, within the capacity of the translators whose services are currently available to the Centre. If the Centre itself is not in a position to undertake to translate any particular paper, it will, on request, act as the agent for user in getting the paper translated into English by a reliable translator abroad.

The Centre's library is open to users during official hours. It answers enquiries and lends books to scientists as well as to librarians of other libraries. Library users are kept informed of the new publications by monthly lists of selective books and reports, as well as by display of - interesting titles of monographs and periodicals.

Operation and problems

Bibliography compilation service. Before a scientist can start work on any new subject field, he must find out what work has already been done on this subject. In developing countries, where many of the research programmes are newly started, there is therefore usually a demand for list of references to published work on many subjects. In order that the Centre can meet this demand, the Library of the Centre has to be well stocked with bibliographical "tools". These tools of the bibliographer consist of - abstracting journals and various reference works in many scientific fields including subject - bibliographies compiled by various institutions, as well as the indexes to the scientific journals themselves, and, of course, the Library's own catalogue of its books and other reports. It is obvious that the Centre cannot subscribe to all the scientific journals in publication, and so in selecting journals acquisition by the Library, emphasis is placed on abstracting journals and journals that include a section containing abstracts.

The majority of the active users of the service are in the field of agriculture, engineering, and technology. Although the policy is to serve researchers in applied science, references on some basic sciences are also provided. At present the reference collection holds 270 titles of abstracting and indexing periodicals, about half of which are subscribed to and the other half are gifts from various organizations and are sometimes incomplete. Indexes and bibliographies without abstracts or summaries or annotations are limitedly useful, as they do not give sufficient information on coverage of articles and it is difficult to determine whether they are relevant to the topic in question.

On request, the Centre provides photo-duplicates of literature. Documentalists first search through libraries in the country. For this purpose, a union catalogue of the holdings of scientific periodicals in the libraries of Bangkok was first prepared in card index form and brought up to date as necessary. This card index was in use, until the first issue of the union catalogue was published in 1968 under the title "Scientific Serials in Thai Libraries" (The book lists periodicals, annuals, memoirs, proceedings, transaction conference and symposia). It is in loose-leaf format so that replacement pages can be issued each year to keep entries up to date. The book contains 326 pages and covers over 6,000 entries including cross-reference.

The literature which is not available in the country is procured from foreign documentation centres or big libraries that provide photo-duplicating service. From the many foreign centres, a few of them are selected on the basis of quick service and least cost. All correspondence is by air mail. The Document Reproduction Unit of the Centre has a Xerox maching for making duplicates of available publications, and holds equipment for microfilm duplication. Few pages of literature are requested in photoprint, many pages are asked in microfilm form. The charge of service is paid by UNESCO coupons or the coupons produced by different organization. This practice is most economical and has been in successful operation during the past few years.

Translation service

In performing translation service, the Centre has its own as well as panel translator, who are well versed in scientific and technical terms as well as linguistic knowledge. When the request on translation of papers on the languages which are not within the capacity of the Centre's translator, the Centre turned, on request, to panel-translators, who are recommended by reliable sources. The Embassies of the country's languages are the regular consultants in this respect. Technical translation service is usually difficult to establish and maintain, owing to the scarcity of translators who can carry out this exacting work. The Oversea Translation Centre, is therefore kept in reserve in case it is impossible to do any translation locally.

Library collection and service

The library has responsibility to acquire reference sources for documentalists, as previously stated. It also collects all kinds of - reference materials for enquiry service, i.e. biographical, bibliographical directories, handbooks, mannuals, as well as dictionaries of all kinds and all languages for translators, and provide reading materials for the staffs of the National Research Council and of the Applied Scientific Research Corporation, who carry their research work in the laboratory. The library subscribes to some 300 scientific and technical journals on general and specific subjects and buy some standard textbooks on the subjects of national interest. Back volumes of journals on the topics in which research in progress are before hands, are purchased 10 years backward. The Centre makes arrangements for exchanging publications with scientic and technical institutions and documentation centres. Over 400 names are on the mailing list for regular communication. The collection of technical and activity reports, received from scientific and research institutes is a big part of library holding. These publications need to be organized so that they can be found quickly when they are asked for. Handling of library materials requires a large personnel with scientific understanding as well as library knowledge. The Centre is still in need of additional well trained librarians.

The library is also a storage of the depository collection of standards and standard specifications, which are obtained by the Centre for Thai National Standard Specification, another organization under the Applied Scientific Research Corporation of Thailand. Although there is no need of cataloguing for this type of material, shortage of space is still a problem.

Research work, the results of which can be industrialized, requires much local information-basic data and what have been done or related with the present situation. The Centre has been collecting all kinds of publications of this type, and publishes "List of Scientific and Technical Literature Related to Thailand" in series. List No.1 was printed in 1964, and List No.4 is now in preparation.

Technical data file

A special facility is arranged for the researchers of the Applied Scientific Research Corporation. Files of information on the topics in which research is being carried out are specially made up. Documents on each subject are gathered in folders and filed in cabinet, so that users can have easy access them. Files in the cabinet are increasing in number, to cover topics of interest which may be potential research programmes in the future.

International relation

Since 1964 the Centre was accepted as the national member for Thailand of the International Federation for Documentation (FID). This not only helps to keep Thailand informed of developments in scientific documentation throughout the world, but enable, Thailand to have a role in the international meetings sponsored by FID. In cooporation with an FID programme the Centre compiled and published a list of technical periodicals published in Thailand. The booklet is called "Technical Journals for - Industry - Thailand." Also information on matters about Thailand is given to foreign agencies. Microfilms and photoprints are provided on request.

In 1968, U.N. International Institute for Documentation on Housing, Building and Planning was established in New Delhi. The Centre was asked to serve as the national centre to coordinate work in this field.

The Thai Government agreed in 1968 to set up "Documentation Centre" in Bangkok for the Asian Highway Transport and Technical Bureau. A part of the Thai National Documentation Centre's building is used for it temporary office until the building of the permanent headquarters at the Royal Highway Department will have been finished.

The Document Reproduction Unit of the Centre is asked to give regular service, so as to avoid construction of this section in the new centre.

Information Service

As the amount of scientific and technical literature is increasing so much that researchers can hardly find sufficient time to read all papers in the topics of their interest, the demand for information service arises, and the Centre is not in the position to provide. It has been in the plan to seek aid from an international organization for the training of personnel, as well as instruction on modern means of information storage and retrieval system. The extension of this programme would help not only the Thai scientists but also overseas enquirers who use the services of the Centre.

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RECENT TRENDS OF SCIENCE INFORMATION AND DOCUMENTATION ACTIVITIES IN JAPAN

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1. Research and development expenditure and research personnel

It is said that one measure of a nation's scientific and technical development is the ratio of R and D expenditure to GNP (Gross National Products) and its application of manpower to research activities.

The importance of promotion of science and technology had been persistently stressed, and research and development expenditure is increasing yearly, but the ratio of R & D expenditure to G N P of Japan is still too short as compared with those of major countries of the world as shown in the following table.

	Japan			USA	UK	USSR
	R & D expenditure (billion yen)	(billion dollars)	ratio to GNP			
1964	381.8	1.06	1.29%	3.0	2.3	3.5
1965	425.8	1.18	1.30	2.9		3.6
1966	488.7	1.36	1.28	2.9	2.4	3.7
1967	606.3	1.68	1.39	2.8		3.7
1968	767.8	2.13	1.45			

Its major portion has been borne by the industry and the government is requested to raise its share as a token of its positive attitude towards science and technology.

Industries	62.8%	Government	30.2%	6.9%

(Non-profit organization)

The distribution of expenditures by fields of science has not changed markedly over the past ten years. The major portion of research in physical and engineering is shared by companies and those in agriculture by the sciences Government. The very large portion of Japanese medical research is shared by universities.

The distribution of number of researchers by organizations in 1969 is as follows:

companies	82,500	50.9%
Governmental Research Institutes	21,900	13.5%
Universities and others	57,800	35.6%
Total	162,200	100.0%

Statistics indicates us that about a half of researchers are in industries and more than a third is in universities. From this it can be said that the distribution of the research activities carried out by these organizations is about the same to the above.

2. Generation of Science Information

As stated in surveys on worldwide production of scientific information, Japan's production of scientific papers is fairly large.

According to "Directory of Japanese Scientific Periodicals 1967"* the total number of scientific publications in Japan including journals, technical reports, house organs, etc. amounts to 4929. Their distribution by major desciplines is as follows;

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* National Diet Library "Directory of Japanese Scientific Periodicals" Tokyo, 1967. 660 p.

	Science	Engineering	Medicine	Agriculture	Total
Number of Journals	894	2,138	874	1,023	4,929
%	18.2%	43.6%	17.4%	20.7%	

These journals are being published at regular intervals or irregularly by professional societies, government research institutes, universities and colleges, and commercial publishers.

The numbers of journals by issuing bodies are shown in table 1.

Table I

	science	engineering	medicine	agriculture	total (%)
Societies	257	738	371	195	1,561 (31.6%)
Universities	263	209	146	108	725 (14.7%)
Research institutes	268	274	110	361	1,013 (20.6%)
Companies & commer. publishers	32	671	177	82	962 (19.6%)
Governments including local,	74	246	70	227	667 (13.5%)
Total (%)	894 (18.2%)	2,138 (43.6%)	874 (17.4%)	1,023 (20.7%)	4,929

Generally speaking, society journals and university memoirs constitute the main stream of generation of science information. Most of journals published by societies and universities are by nature aiming at to carry mainly original papers. Publications by governments and local governments are by nature to carry observation or experiment data and statistical reports. According to the characteristics of information conveyed by each journals, the classification is made in the "directory" as follows:

A	(Original Papers)	2110 (titles)	42.9%
B1	(reviews, commentary)	1090	22.2
B2	(news, business, reports)	920	18.7
C	(abstracts)	120	12.8
D	(data, statistical figures)	679	13.8
E	(popular sciences)	28	0.6

Therefore, almost 80% of society journals are A and B1 type journals and 95.4% of university journals is A type journals. 60% of government publications are D-type journals.

The number of Japanese total production of original papers in fields of science and technology is approximately 150,000 a year. This figure is estimated by a convenient means from the numbers of abstracts in representative secondary publications in major field to cover Japanese papers, that is, Current Bibliography on Science and Technology by JICST (71,000), Japana Centra Revuo Medicina (73,000) and Annual Report of Japanese Agriculture (9300) in 1969.

It is said that recent worldwide production of scientific papers are 3,000,000 a year, so Japan's share can be said fairely large, amounting 5% of world total.

Other resources of technical information are patents and utility models. The number of applications for them became to rank above all other countries of the world in 1966. This would seem to be the reflection of accelerated R & D activity coupled with rapidly gaining awareness of protecting industrial property.

Patent applications in 1966	86,046
Utility models applications	119,061
Total	205,107
Patent registered in 1966	26,315
Utility models	29,621
Total	55,936

This places Japan in 3rd to 5th ranks of world depending on subjects fields; for instance, the 3rd in Chemistry and the 4th in physics, so on.

It goes without saying that in spite of its geographic and linguistic remoteness Japan has been making efforts increasingly to improve scientific communication on an international basis by (1) publishing English version or edition of journals; (2) carrying English abstracts and legends of illustrations in Japanese language journals; and (3) widening coverage of Japanese papers by world abstracting and indexing services. Most of these efforts are made by Japanese scientists and professional societies with or without governmental financial supports.

Table 2 shows the language distribution of Japanese journals and their accessibility to non-Japanese language people.

	Sciences	Engineering	Medicine	Agriculture	Total (%)
Total Journal	894	2,138	874	1,023	4,929 (9.7)
A. English journal (including German and French)	209	147	93	29	478 (7.1)
B. "Mixed" language journal(Eng. & Jap.)	132	91	66	63	352(83.2)
C. Japanese language journal	553	1,900	715	931	4,099(12.3)
C'. C with English Abstract	83	225	161	139	608
A+B+C'= E Accessible to non-Japanese people	424	463	320	231	1,438
%	(47.4)	(21.5)	(36.6)	(22.5)	(29.1)

3. Documentation and Information Activities

In Japan, there existed a few distinguished indexing or abstracting services such as IGAKU CHUO ZASSHI (the Japanese Centra Revuo Medicina) and NIPPON KAGAKU SORAN (Chemical Abstracts of Japan) whose coverages are confined to Japanese documents only, researchers have been forced to find out necessary information by themselves with a very limited access. In 1957. The Japan Information Center of Science and Technology (JICST) was established as the first execution of policies of the Science and Technology Agency of the Japanese Government. The aim of the JICST is to act as a central organization of science information services in Japan through systematic acquisition, processing and dissemination of scientific and technical information, both foreign and domestic.

Therefore, the JICST started its activity by putting emphasis on secondary information services, by publication of a series of abstracting journals, "KAGAKU GIZYUTU BUNKEN SOKUHO" (Current Bibliography on Science and Technology), and "GAIKOKU TOKKYO SOKUHO" (Foreign Patent News). This marked an epoch in the history of information services in Japan and the dissemination of information for research and development, particularly for the industry, was strengthened. Now, nine series of Current Bibliography are published regularly, and approximately 330,000 abstracts of journal articles and technical reports of world-wide coverage are disseminated yearly through this publication. The JICST also conducts photoduplication, translation and literature search services upon requests, and users of these services are growing yearly. Some specific services, entrusted by the Ministry of Agriculture and Forestry, and the Smaller Enterprise Agency are also worth mentioning.

To execute its role fully for the rapid dissemination of voluminous information, the JICST started to apply computer technology to information processing and photomicrotechniques to document storage. The researches on information science and technology, training of information specialists, and mechanism of clearinghouse are now considered as functions to be strengthened or added to roles of the JICST. The extension of the coverage to life sciences is required of the JICST for the more comprehensive service as an integrated information center.

International and domestic liaison activities of the JICST also play an important role for smoothly running of the JICST services. The JICST is in friendly or cooperative relations with various governmental organizations as well as various societies, research institutions and industries. The JICST alway gets contacts with related organizations in foreign countries and participates actively in activities of International Federation for Documentation, International Council of Scientific Unions, American Society of Information Sciences, etc. by sending the staff to various international conferences. The very beginning of 1970, the agreement between the JICST and National Library of Medicine in U.S.A. was set up for conducting experiment to explore the possibility of establishing a regional center of MEDLARS. Now MEDLARS tapes and necessary documents have been sent to the JICST and the experiments are now being carried out with participation of the staff of Keio Medical Library.

The JICST Staff also play active role in lecture meetings and training courses, held within the country. As activities for promotion of scientific and technical information services, National Convention on Information and Documentation (Annually) and other meetings are held by the JICST.

The National Diet Library has become active in building up a large collection of scientific and technical resources since 1959. The emphasis was given to the acquisition of journals and technical reports and special bibliographies and catalogs are published for promoting the use of its collection. The NDL subscribes approximately 10,000 titles of scientific and technical journals of worldwide coverage (among them 2,000 titles are Japanese journals). 410,000 items of technical reports and dissertations are collected in 1966. The NDL publishes a monthly index journal,

4. Introduction of computer technology

Japan is known as one of the biggest producer and user countries of general-purpose digital computer systems in the world. The number of operational sets amounts to about 4,000 in 1968. These are mostly applied to office management and scientific computation.

From its very establishment period in 1957, the JICST had carried out experiments on a punched card system, then a small-scale computer system operating on magnetic tape. In 1968 a decisive development was done to adopt a computer-controlled photocomposition system operating new high-speed Kanji printers.

This system became available around the end of 1968 as the first operational system in the world which is capable of editing and photo-composing entire abstracting journal in Japanese language using Kanji, Kana, and alphabets. It also aims to expand spectrum of services and products (SDI, search, etc.) resulting from processed magnetic tapes. System design and programmes for these new services are almost completed.

Beside the JICST, various research laboratories developed computerbased information systems of limited scope, such as alerting and retrieval, for internal use and set them in operation. However, most of them use coding schemes or natural languages in English, Romaji, or Katakana, not so "natural" as orthography is concerned.

The necessity of compiling Japanese-language thesaurus for indexing and retrieval purposes is now urgent. The JICST has experimentally compiled thesaurus of chemical terms (21,700 words) and that of metallurgy (12,000 words) in Katakana by computer. The Science and Technology Agency blueprinted a three-year project to compile a basic thesaurus covering all fields of science and technology, to meet the general need.

The developments of software and data transmission techniques are relatively behind as compared with hardware techniques, and shortage of systems engineers, operators, and programmers is critical in Japan. Accordingly the Japan Information Processing Development Center was created at the end of 1967 and compatibility of software and hardware techniques, standardization of input data, wide use of package programmes of high utility are principal problems to be tackled. The Development Center is now giving efforts to establish standards of core curricula for training programmers and keypunchers, and holds courses for systems engineers and designers. These will contribute much to the over-all progress of management information systems (MIS) as well as scientific and technical information systems.

The development of mass-memory to enable time-sharing use with more ease and CRT display units is the present target of computer technologists in Japan, and is earnestly desired in the field of scientific information in particular.

"ZASSHI KIJI SAKUIN" (Japanese Periodicals Index). Its science and technology series carries approximately 65,000 papers from 1,300 Japanese Periodicals.

There are approximately 600 academic societies in the field of science and technology. They are the largest generators of primary scientific information through organizing specialists in their respective fields, and publishing journals for the dissemination of scientific knowledge. They also contribute to international exchange by initiating or strengthening English-language journals.

In recent years, organized efforts for the acquisition and dissemination of specialized information became active in various institutions. For example, Technical Information Division of the Japan Atomic Energy Research Institute, the Railway Technical Research Institute, the Electrical Communications Laboratory, etc. are reinforcing information services for the research and development of their parent bodies, aiming to the specialized information centers in their respective fields.

As regards international exchange of information, the Japan Atomic Energy Research Institute publishes an abstracting journal in English "Nuclear Science Abstracts of Japan" (quarterly) to inform research results of Japanese scientists, and eventually take part in International Nuclear Information System. The Railway Technical Research Institute also publishes "Railway Engineering Abstracts" (quarterly)

There are needs, both foreign and domestic, to consolidate data for science and technology. According to ICSU decisions the following organizations are newly established, or reinforced; World Data Center for Cosmic Rays, World Data Center for Nuclear Radiation, Japan Oceanographic Data Center, etc. In this regard, Science Council of Japan made recommendations entitled "On evaluation and compilation of numerical data for natural sciences" in 1968.

There are about 600 university and college libraries. University libraries also act parts of scientific information resources in conventional sense. The Science Council of Japan recommended that they must be modernized and strengthened to function as science information systems. They Ministry of Education plans several means for their improvements, such as computerization of library operations.

Under these circumstances, industries were aware of the significance and implications of information activity in earlier days. Especially after the restoration of economic power in 1950's, each reinforced its department of research and development and the amount of their R & D investment grows yearly.

Major manufacturing companies established or expanded central research institutes or R & D departments and information services were aligned as well. They are now trying to set up their own systems of information, as well as effective utilization of the JICST services. Eighty percents of the JICST users are industrial companies, and our user survey shows that seventy percents of demands are already satisfied by the JICST.

The number of researchers on pattern recognition and machine translation is absolutely few. The delay of solving technical problems in "letter" handling is very remarkable and studies on the mechanism of man-machine interaction are seriously underdeveloped. There will be urgent need to establish a nation-wide structure for R & D in information science.

Projects for computer application to information and documentation techniques which have so far been carried out are listed below:

Purpose	Organization
Book catalog	Japan Atomic Energy Research Institute (books and journals)
Current awareness	Mitsubishi Atomic Power Industries, Inc. (Journal articles, reports and patents)
	Nippon Telegraph and Telephone Public Corporation (journal articles)
	Ube Industries Ltd. (journal articles)
Retrieval	Hitachi Ltd. (patents)
	Japan Development Bank (documents)
	Kobe University (journal articles)
	Ministry of Foreign Affairs (documents and correspondences)
	Patent Office (journal articles)
	Mitsubishi Electric Co. (journal and Internal report articles)
Photocomposition	Japan Information Center of Science and Technology (journal articles)
Translation	Kyoto University (English, Japanese; answer in synthesized speech in Japanese)
	Kyushu University (English, Japanese)
	Electrotechnical Laboratory (English, Japanese)

5. New Direction for Information Policy

With the unexpectedly rapid progress of information processing and transfer technology based on electronic data processing systems, and the renovation in electrical transmission techniques, the data communications, which combine two technologies, have become a reality.

In addition, microfilming techniques, diverse retrieving machines, photography and facsimile technology are being advanced day by day. With the appearance of new technologies, the conventional information storage and distribution systems have become to be rescrutinized. Under such situation, the Council for Science and Technology (an advisory body to the Prime Minister, dealing with overall promotion of governmental policy for science and technology) has examined basic measures to be taken promptly since 1969. The result was reported to the Prime Minister in October, same year. In this report, a concept of nation-wide system for the flow of scientific and technical information was proposed. This proposed concept called NIST plan in shortened form is worked out with a view to finding out a mechanism which might be necessary in order to communicate research and development results to users rapidly and accurately. (the details will be given later by one of the lecturers.) Although the implementation of the NIST plan will require time and money, people concerned expect that the system in operation will much contribute to the advancement of science and technology and the promotion of industries, meeting diverse and sophisticated needs of information in "postindustrial age".

ANNEX 6

Syllabi of Lectures

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Tokyo, 21 July 1970
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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

PRINCIPLE OF CLASSIFICATION AND INDEXING

Y. Kobayashi

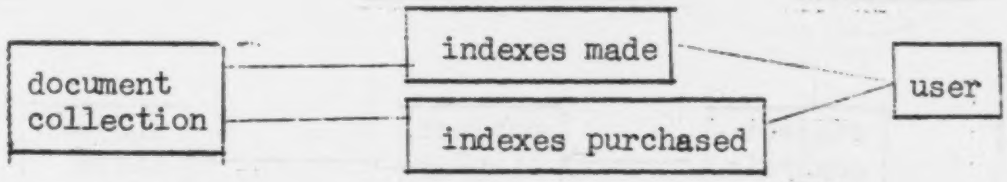
1. Generally, to have an index means to be able to approach an information file of some size relatively easily and quickly. And the effort required for indexing seems to be proportional to the effectiveness of retrieving desired information out of the file thus prepared.

Take a personal file as one extreme, its file size does not exceed 1000, and the approach to it is usually made through limited channels, the indexing efforts made and retrieval power of the file prepared does remain minimum.

On the contrary, in the case of large-scale files, which will meet various needs of many users, the file content as well as the composition of users become much more complicated. And the index becomes not only large in size, but also highly complex in its quality. In other words, it is necessary to throw larger efforts into indexing work in order to secure more advanced retrieval effects.

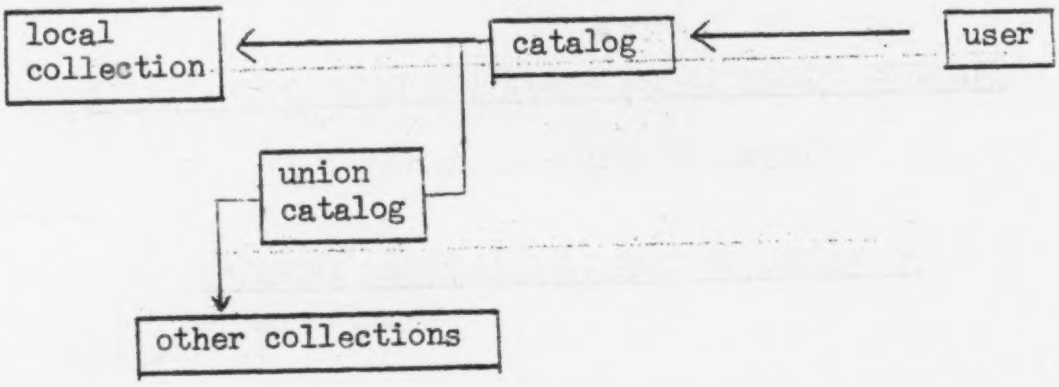
2. Practically, the main task of our documentation or library services is to prepare one or more indexes to make the user approach documents effectively. In this regard it is requested first to save valuable manpower by selecting optimal available tools. (Needless to say that the proper understanding of information needs and construction of document collection just meeting the needs are presupposed, but the procedure for them is out of our concern here.)

The generalized relation between the document collection and user can be schematized as:



3. The function of indexes is twofold; to show location of documents and to help user select his desired information. The former function is called library catalog. Cataloging procedures and functions of catalogs differ widely from books to journals.

On the other hand, in either case, a catalog of individual collection must be supplemented by a union catalog to fully meet today's information needs.


local collection
catalog
user
union catalog
other collections

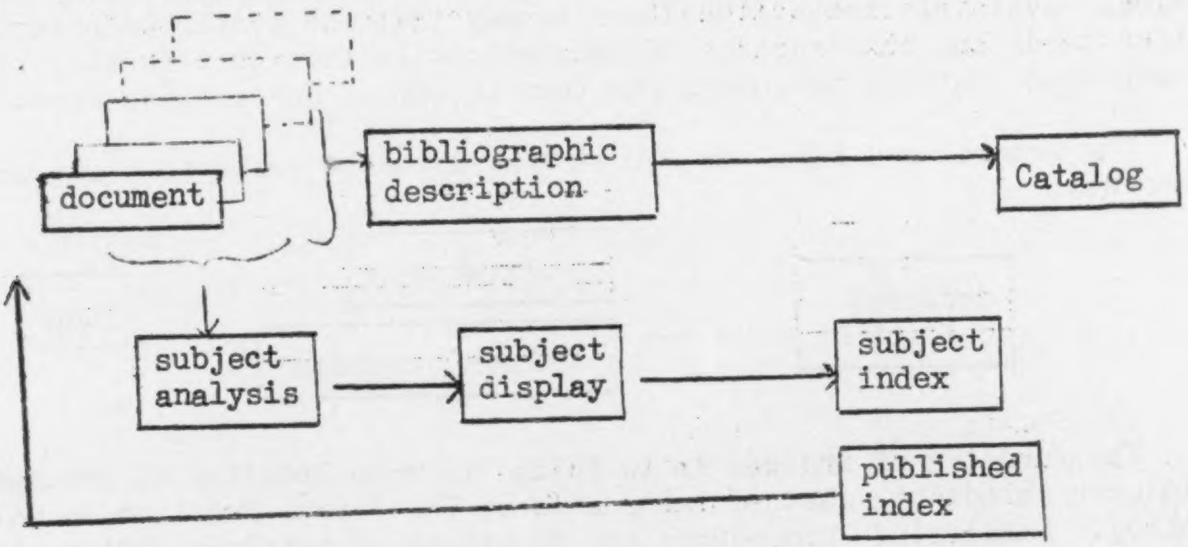
Today, as document locating became international in scope, it may be only exceptional that the user himself will consult the union catalog, rather, the compilation of a nation-wide union catalog, and training of reference librarian qualified for document identification and procurement from abroad is a prerequisite of national documentation centers.

In this connection, standardized procedures are more urgently needed.

4. The other function of indexes, i.e., that for selection of information, particularly for subject approach, is the most important one.

Generally speaking, information contained in books and that in journal articles can be indexed in the same manner. However, to simplify the matter, indexing of journal articles is stressed hereunder.

In broader sense, the indexing is defined to be consistent characterization of information contained in large amount of documents.


document
bibliographic description
Catalog
subject analysis
subject display
subject index
published index

It seems to me that the methodology of subject analysis is not yet established, but by experience we can look on several methodological groups.

At the beginning we must clearly state our indexing (or subject analysis) policy. As mentioned above, the manpower required for indexing and the retrieval power are assumed to be proportional each other, the degree or extent of indexing (or retrieval) depends on the following two factors:

a) intellectual manpower actually available for indexing,

b) quality of information needs required of the system.

If the indexing manpower is limited, deep indexing becomes practically impossible. When sophisticated index system is yet required under such circumstances, we have to depend mostly on published indexes.

From another point of view, it may be wiser to utilize published indexes in such subject fields were these are available, and direct the limited indexing manpower to selected areas where needs are very strong but available indexes do not work sufficiently. This principle, I think, holds true regardless of time and space.

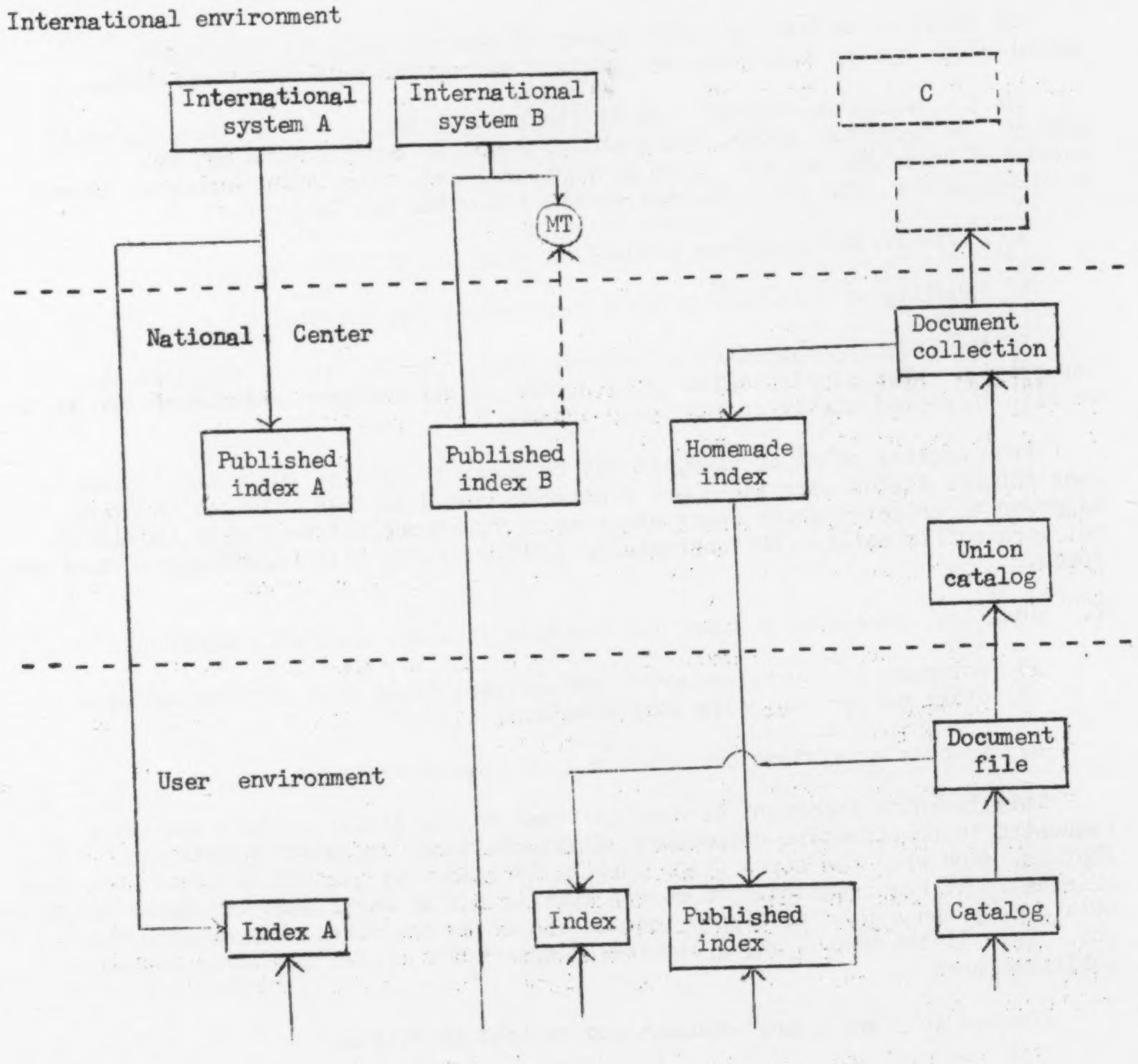
7. Ideally, published indexes and homemade ones are desirable when:

a) coverage of source documents and subject field does not overlap each other but are mutually complementary,

b) processing systems are identical or compatible.

This is quite important because national documentation centers are being requested to be effective components of international information networks. That is, even when the size of the work is limited, its quality or level must meet international requirements. Of course this is not an easy task, but experiences obtained by the use of published indexes should be the first step towards this end. Here is the reason why I stressed larger index system including use of published ones.

Figures in 3 and 4 are combined and revised as follows:


International environment
International system A
International system B
C
MT
National Center
Document collection
Published index A
Published index B
Homemade index
Union catalog
User environment
Document file
Index A
Index
Published index
Catalog

As schematized in this figure, the national center cannot monopolize all approaches to information in general. The weight of the national center is a relative value, to be determined case by case. If the use made of the center is high, it can be certainly said that the center well understands the needs in the country.

8. When we need to make some indexes, what technical problems will appear in this respect.

Theoretically, information is not "substance". But it is necessarily materialized in the form of printed document and rendered for dissemination and storage. Moreover, the approach to information contained in these documents is also made possible through indexes materialized likewise.

Therefore, at both ends of information storage-retrieval system handling of materials as means of indicating information is required. (See CHECKLIST)

A CHECKLIST OF INDEXING, SEARCH, AND FILE

by Y. Kobayashi

Bibliographic description	Document arrangement	Items processed	Approach through	Search means	Applications
No	Name	No	Name	Doc. file	Business filing
	Orig. doc. no.	No	Number	Published index	Tech. reports Patents
Yes	Accession no. Document name Date of pub. Geographic div.	Doc. name	Doc. name	Sheaf catalog Plain card Visible card	Periodicals
Yes	Classification Document name Accession no.	Subject class. single multiple	Classification code	Plain card Edge-notched card	Books
		Subject term	Term	Interior-notched card	Journal articles

The handling of primary information materials is long established as library operations. But to make sure of the facts, I would like to reconfirm actual conditions of these operations.

Usually books are classed on the shelves, and the subject approach other than shelf classification can be carried out through classed index (multiple entry) or alphabetical term index. The location of individual books is indicated by call numbers.

In constrast to this, journals are arranged alphabetically by title, or classed as in books. Anyway, approach to one journal title (ever-increasing document species) does not mean the subject approach in the genuine sense of the term. Consequently, subject approach to individual journal articles requires some indexes. Moreover, the location of journal articles must be indicated (indirectly) by these indexes.

9. The index takes various material forms:

a) plain card

b) edge-notched card

c) interior-notched card

d) book form.

Types a) -- d) have features respectively. Card forms are versatile means as central file, but most in convenient for distribution (more expensive). On the contrary, book form has a drawback of fixed data content (and arrangement), but is relatively inexpensive for distribution and much increase contacts with users. It is particularly useful if combined with regular circulation of newly accessed information (alerting service).

It is of course possible to distribute card indexes, and examples are not rare.

Regardless of material form, those intended primarily for distribution can be called published indexes, and used beyond compilers' environment, and the largest problem here is how to make them economically feasible.

On the other hand, construction of a central index file imposes less economic problem from the viewpoint of production of material.

Another point of interest lies in the mode of utilization. Plain card files and book-form indexes are consulted by looking up and reading out desired information according to predetermined filing order, but notched card files need some manipulation (and device) with post-coordination of search terms.

10. Now, let us examine the intrinsic function of indexes. Indexing operation can be divided into two, subject analysis and display of subjects thus analyzed.

Microscopically, a single journal article is said to be composed of more than several thousand words on an average. It is a question whether this article could be characterized by a couple of words? Out of these several thousand words, over 50% are common words (e.g., THE, OF, AND, TO,... in English) which primarily indicate grammar. Remaining words, still amount to a couple of thousand, are "significant" in some respects. So, along this line it is difficult to grasp the whole.

Therefore we must go away from this word-pursuing way of thinking, and give ground for characterization of journal articles by pattern recognition method. Scientific article is to describe or propose something new. Theoretically the newness can only be proven by collating it with the entirety of knowledge existing at that time.

To put this operation into practice, facet analysis, is I think, the most powerful and easy-to-understand means. I use the word "facet" without definition, so it must be understood very softly.

11. For instance, in the broad field called "chemistry", where formation and detection of substances, interaction between substances, etc. are studied, it is clear that there exists a facet representing the common concept of "substance". In the literature of chemistry, we can easily find out a group of documents which deals with different substances by the same method. On the contrary, there is another group dealing with the same substance by different methods. Thus we can identify the facet "operation" or "process".

If we apply these two facets to analyze a given journal article, it is made easy to determine where the newness of the article exists, in "substance" or "process" facet.

Of course we cannot analyze all chemistry documents with the help of only two facets. Actually we frequently need "substances" to carry out some "operations" (e.g., reagents, catalysts"). Or, if the "substance" remains unchanged, we usually conclude that no "operation" was carried out upon this substance. Thus a facet sometimes require "subfacets", or more precisely, one facet is liable to be subdued to other facet.

When we facet analyze an article with as minimum facets as possible, we can characterize the given paper in the context of a group of similar papers.

Next problem is how to express the analysis results. In order to analyze papers, we need a tool commonly understandable by the indexer and the user or searcher. Take the simplest example of expressing "length". Words "long" or "short" indicate only a relative concept and cannot exactly communicate the exact (specific) length of the material concerned. Consequently, it is necessary to have a common and concrete measure as the word foot or fathom in English.

Take another example. To indicate "person" in a family, words such as "father" or "mother" are sufficient, but this person goes out of the family, the word "father" does not go, and one needs a "name". But this name is of no use when he gets on a but. We use the "name" not only for identification, but also for calling him later again.

In the same manner, we use correct "names" of phenomena and substances to call them out when they are needed, and we call them "index language" in our work. Of course the index language is also used as search language for retrieving documents.

13. Scientific papers are presented in natural languages. So any information element contained in these documents is also written by words, i.e., has its "name". If so, it seems to us "natural" to use the word as it stands. Why we need "index language" of artefact?

According to Meadow* cites four factors as measures of effectiveness of index language:

Expressiveness

Ambiguity

Compactness

Cost

14. As typical index languages used in conventional search systems I will mention the following:

Hierarchical classification - UDC Subject headings
Keywords (coordinate indexing)

Universal Decimal Classification (UDC) scheme is most widely used in Japan for documentation purposes. The Japan Documentation Society is responsible for preparing Japanese editions of UDC, and its use was much accelerated by its adoption by JICST in 1958 for use in its "Current Bibliography on Science and Technology".

UDC is encouraged to use in multiple - entry method in precoordinated form to enlarge subject accessibility to the file.

To keep consistency of classification, the JICST "fixed" the length of individual classification numbers and precoordinated forms when if straight numbers do not exist in the UDC table. This was inevitable in a large-scale information service such as JICST, in order to control operations and increase efficiency.

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* Charles T. Meadow: The Analysis of Information Systems. A programmer's Introduction to Information Retrieval. New York, John Wiley, 1967. p. 20-21.

Such a convention, however, must be determined not only by indexing languages (classification schemes or vocabularies), but also by the sound balance of exhaustiveness and specificity of indexing. (As regards this, refer to Lancaster Report on MEDLARS*)

15. Subject Headings system is not so wide-spread in Japan. In contrast to UDC, here we face the problem of language and orthography, but the basic concept of using natural language as index language becomes essential because various computerized systems adopt "thesaurus" approach.

Generally speaking, natural language has larger expressiveness than classification. At the JICST, free keywords in Japanese have been accumulated as raw material for future structured thesaurus. For last one and a half years we gathered about 70,000 words, and statistics on the use frequency of each word were obtained. The next step is to refine and give structural relations of these words, by consulting other vocabularies, published thesauri, and classification schemes.

By this experience, it can be said that because of variety of orthographic notation of Japanese language, the process of reducing ambiguity will be more difficult than in other languages.

The final step of evaluating thesaurus is to test it or a working model as regards search consistency and efficiency.

16. Edge-notched cards, file combined with classification or uniterm (coded), permits random access and postcoordination of terms at search stage. Consequently, this method is, in a way, an intermediary step towards mechanized documentation service.

Versatile search capability of this system will be fully exhibited if the field is well defined, and system is suitably designed.

As the lengths of four edges are physically limited, compactness of notation of index language is highly required. Instead, on the both sides of a card may be used to record abstracts and sometimes graphs or structural formula of chemical compounds.

17. Interior-notched card file for optical coincidence is usually constructed by "term card" method (inverted file). In this method each card carries only one term each, and sequential number of the document pertinent to the term is punched on the predetermined position corresponding to the number (expressed by coordinates). Punching of numbers is equal to indexing operationally.

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* F.W. Lancaster: MEDLARS; Report on the Evaluation of Its Operating Efficiency. Amer. Docum., 20 (2), p. 119-142(1969)

To search by a subject composed of, say, 3 terms, 3 term cards are extracted from the file and superposed each other. If a punched hole is common to all 3 cards, we can see through this hole, which indicates that the number, represented by the hole position, is the document carrying at least 3 terms simultaneously (logical product). Then you must consult the document file or index (abstract) card file for further examination of information.

18. Summing up above methods, it can be concluded that:

a) plain card index file (UDC or Subject Headings) gives a single access point. If the card carries abstracts (or tracing of index terms other than that consulted first), you can further define the matching of terms, selected against your interest.

b) in notched-card file, it is free to choose one or more access points simulataneously. In latter case the search is done by logical product of terms.

In case of edge-notched card, it is possible to presort and arrange the file by a single term. This method is a modification of plain-card-single-entry file.

Interior-notched card cannot carry abstracts, so its search strategy strictly affects the retrieved results. Therefore at least abstract card, easily consultable, must be used in combination in order to regulate and confirm search procedure.

Anyway, physical device by itself cannot determine total effectiveness of index systems, rather, the human factor is predominant throughout the system. Human factors, however, do not mean human skill, we have to organize individual skill and experience into clearly defined policy, principles, and procedures, and prepare reliable tools to have maximum effectiveness established in the system.

Distribution: limited

DOCTEC/LEC/2
Tokyo, 22 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

FILES CLASSIFIED BY UDC

H. ONOMURA

Nippon Steel Corporation

1. INTRODUCTION

It is not so difficult to hear "How to find out documents," but "Information Retrieval" or "IR" are regarded as a method using computers. Besides in the light of the present information age, manual cards are outdated at a viewpoint.

But "Information Retrievals" are to be done to the "Quantity and Quality" of information which are necessary for each fields. The problem is how much the absolute quantity as a result of alerting - Scanning - Screening. Therefore it ought to think of the most suitable method of index for the problem.

2. INDEX CARDS

There are limits to a man's memory even who are for superior to computers, the author always to say "not depend on memory but documents." For instance, the brain of man should not be used for memorizing of classification numbers in which are able to find out documents, but for clearing function even if he can learn by heart.

It is need to make up masterkey that can obtain by a man who want to get the information at a good timing.

Exclusive of glance through only Current Awareness, we can not find out the necessary information without index on the occasion of the retrospective search. Even if a man could found out, it is a mere chance and make false rejection. As regards "Index" is provided for another paper, this paper shows only card format understanding "the last purpose of making out index is finding out the scattered items."

3. CARD SIZES

It is enough to select the card, for instance A6, A7, international standard card (75 x 125 mm) IMB size card, according to the purpose. These samples are shown in Fig. 1 Fig. 2 ..... International standard cards which are seen usually and the same size of ABTICS (abstract card relating steel), can envolve 200 characters by 9 point.

Proper thickness of card is 200 kg and it seems to be better not too much thick.

4. ITEMS RECORDED

a. subjects: natural words, abbreviations, characters (numeric, literal).

For example UDC, Keyword and so on.

b. original title:

no take in hand as a rule. process the title in some case, for example "Our country" put the country name in brackets.

c. author: put on affiliations. There are many ways how to write author name, generally put the surname in front of the name. For example A.B. Searle becomes Searle, A.B.

when the authors are more than two persons, connect with comma (,) instead of conjunctions. From the second author, not always put surnames in front of the names except for only entering the heading.

d. journal title:

determine abbreviation or complete title. When it is abbreviation, there are some method to determine, ordinary List of Periodicals form of Chemical Abstracts which covered 12000 books.

For example, Complete Chemical Abstracts of Japan is corresponding to Chemical Abstracts in United States, but it cannot be adopted directory in some respects. Besides jornal title, need year of publication, volume, issue, pagination. At the time on the occasion of pagination, take care of next points.

Usually indicate from 1 to 10 and beginning and ending. When page is shipping, express the page like ~~1~~ 12. If the books have consecutive pages of volume and consecutive pages of issue, take volume pages.

e. place of original book

f. number of documents for custody

g. abstract

"Communication by means of cards are divided into two cases, i.e. the care that taking a primary document as a card and the care that making a card as a secondary document. In any case, merits of card system are able to change the arrangement of a cards and put the new card between old ones. Furthermore the only necessary card can be drawn out from the whole, especially notched card. Until now, card method has been used mainly as secondary documents.

Supposing that the card are used as primary documents, they were for only short and simple data, as a data card."

In the last few years, many forms were emerged microfishe, microcard or thin jacket type one after another by the developments of microform techniques and equipments, and come to be able to see the primary infrmation documents by card formats.

PCMI form that can contains over 3,000 frames on a piece of transparancy had already been developed in the United States. Microcards come to have index function by the aperture cards.

5. CATALOG CARDS

Catalog cards of books which are most foundamental forms of index cards are represented in Fig. 3 - Fig. 8

It is natural that formats of index card are altered by the object documents, on the contrary to make uniform is no good.

6. ABSTRACT CARDS

Almost abstract cards having excerption and its size is 75 x 125 mm.

Fig. 9 - Fig. 14 are examples of another companies.

Abstract cards which having no excerption are shown in Fig. 15 - Fig. 20. Using these methods which cover with classification numbers, can save much time and trouble and they will not come into existence without large activities by the documentalists.

Though if documentalists play the role of interpreter on reference skillfully, the time for information service will become short.

7. REPRODUCTION OF CARDS

Until few years ago, using mimeograph was the only method to make reproduction except "printed card."

It was a common trouble.

Though since Xerox were imported, it is not too much to say that the troubles were solved at once.

As regards as books, the usual number of book to purchase is one and consequently the place of the book on a stacks is limited to one place.

Therefore multidimentional approaches are essential.

As a result of caluculation by author, it is enough to need 3.5 pieces of cards on the average against one book.

Namely, if you have 35,000 pieces of cards for 10,000 books 13 files, 5 steps, about 2 pairs of card case and find out one of three items, classification (average three), author's name (including a joint author) and the title of the book, so you can truly arrive a desired position.

Figure 3 - 8 shows one example of many number of reproduction. Total average is within a number of four as shown before.

The routes are desired as many as possible in climin's Mt. Fuji. Speed of retrieval get soon as much.

Some trader recently deals with cards reproduction using Xerox as shown special issue "Dokumenteshon - Kenkyu"

My method is as bollow; first in Ken paper you reproduce a number of eight cards of 75 x 125mm in size, and cut it make a rod hole.

In this method, Speed of reproduction get soon and card can file in one or two days after acceptance of the goods.

There are two important point in card paper stock: One is that the edge of paper, "Kami no me" should be horizontal alone with the long size of the card. As the goods on the market is vertical it can't get to fit the role of the typewriter regardless of thickness of paper.

When use the top of the card efficiently, that is disregarded point. It is necessary to improve how to use together.

Another is the form of rod hole. There are two types; circular and notched elliptical type. The author names the latter B-type. Advantage of B-type, as realized in figure 21 - 24, is that the card can take in and out without drawing out the rod as shown figure 24.

As the rod is not circular for but flat for, it can't draw out when horizontal, but it can do from slit when rotate 90 degree.

This method is used for ABTICS card (Fig. 21) of English Iron and Steel Organization (they called "Oval-hole")

But it is very regrettable that ABTIC card is indifferent to the dimension of the card.

Most important thing about retrieval of manual card is arrangement of 75mm of up and down. But the variations of right and left are tolerant.

8. Filing of Cards

As book-form and list-form filing is made according to the constant order itself, all you have to do is read over some notices.

But of card-form filing, it is necessary to determine the filing order to the every kind.

I think it indifferent to the filing order unexpectedly.

Some say that it should not be made rules so fine or that it should be.

For this two cases, the user should be decided and control.

But in method of thinking, it is useless to think absolutely sationary.

Specially those who engaged in reference service should understand the meaning as the tool.

It is misunderstanding to think of filing card as the routine work of "library clerk."

But documentation is the war against the number, so the method of correspondence is proportion to the amount of information.

Some thing to be thought before filing are as follows;

(a) It shows added entry point to the main card (author call this A-card)

It is useful to draw out connection card to prevent misconnection from changing classification of what make added entry or make analyticals.

In making added entry, it is very important to determine the choice of retrieval factor.

It is meaningless that XX Handbook Edition Committee titles the author's column.

(b) It is rather better to distinguish foreign language book from Japanese-language one.

Then it is necessary to translate Japanese into English.

It is necessary to determine the romanization method. Cyrillic alphabet is as the same.

(c) Excluding discussing about unification of pronounciation of heading, for example, whether "Japan" is pronounced Nihon or Nippon. It will be uneasy of refernce without technical unification of those two words, and it would be better to arrange in one word taking obscurity of pronounciation into consideration.

(d) A correct original spelling is very difficult to get out of Japanese transliterated word. First of all it is important to attempt to obtain it from all information available. The Correct author's name, for example, may be obtainable from the original book. If still obscure, romanize without further arguments. But Japanese word in combination with English such as X-sen would be better to be remained as X-sen instead of spelling it as X-rays.

(e) When the number of authors exceeds four, the listing shall be the first three as it is difficult to select three in order of the extent of each of their contribution.

(f) Delete the initial article when lettering title heading. With these rules in mind file cards of each topic in the following way.

A. Classification Cards

File them in order of heading numbers. In cases of more than one card has the same heading number, file them in alphabetical order by author's name the first author listed in book). In case cards have no authors, place them in front of the same heading number group and file them in alphabetical order of book title. In case more than one card has the same heading number and author, file them in alphabetical order of title. In case more than one card has the same heading number, author and title, file them in order of volume number, published year and registration number, respectively.

B. Author Cards

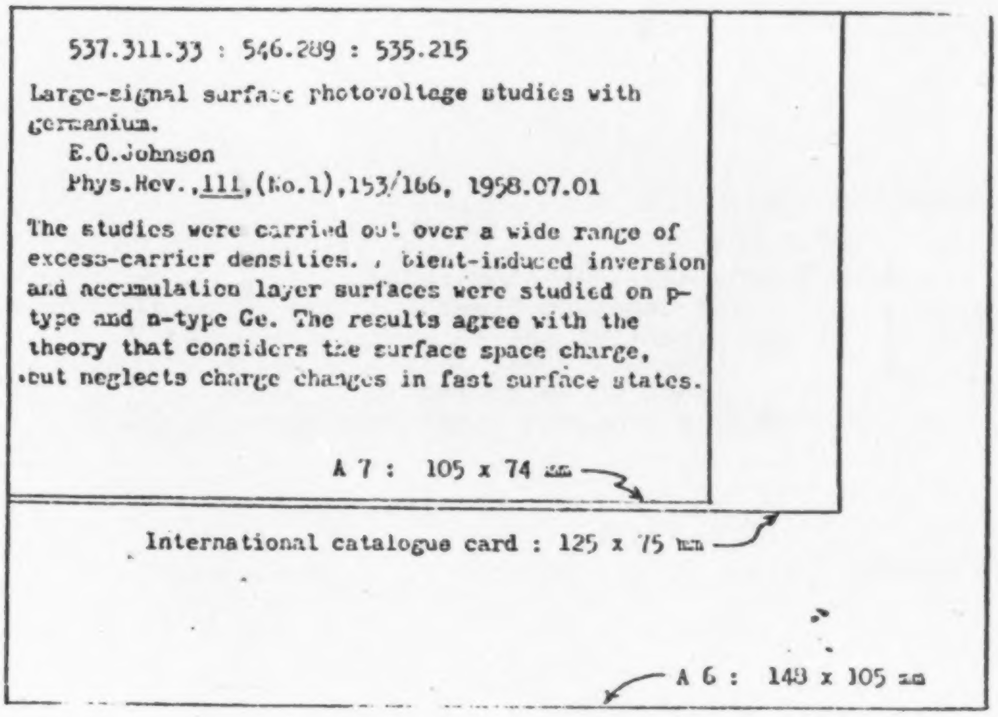
File them in alphabetical orders of heading author's name. In case more than one card has the same author, file them in order of card heading number (the first number listed in book). In case more than one card has the same author and heading number, file them in alphabetical order of book title. For others the filing rules are as described in A.

C. Title Cards

File them in alphabetical order of heading title. In case more than one card has same title, file them in order of card heading number (the first number listed in book). In case more than one card have the same title and heading number in alphabetical order of listed author's name. For others the filing rules are as described in A. Since the description of the above filing rules is only to show one filing model, the method above need not be the only one to be formalized. The important point is to avoid employment of various filing methods within the same organization. In this respect, arguments such as Japanese alphabetical order filing would be better, what kind of romanization methods would be best, etc. should be avoided. However, the problem of transliteration has recently been raised at ISO/TC46 (Documentation), and though there must be many other such problems left pending in this country, Japanese, Cyrillic and other language letters are now showing a tendency to be romanized or standardized. What if this kind of problems were to be discussed without Japanese people? This is why much concerns are needed from each of us Japanese.

9. Use of Published Indexes

A model method of using publishing indexes has so far been stated for the purpose of making the most effective use of them. This is the case with the documentation basic procedure which has the same purpose for effective use of information. A thorough knowledge of published indexes of each different form is, though evident, needed for using published indexes effectively. Books listed in the bibliography will be of a good help for this study. The author, however, from the view point of his field would recommend Index to Publications which is issued for all kinds of publications once a year by the Iron and Steel Institute and which also includes ABTICS. As it is very useful, the author gives its brief description. The method used in the index should be considered one of the models when we make indexes. It is not most ideal to only depend, on UDC method only because you have been using it. In ABTICS cards, in this respect, the aforementioned book, Index to Publications is composed of name index and subject index. Since organization names are also included in the name index besides author's names, it seems the name card is called that way instead of Author Index. The subject index is well considered finding a card from more than two different subjects, if necessary. (as shown in the fugure 27). Serial numbers are pointed in both name index and subject index. Therefore, even if cards are filed in order of serial number or UDC, with the concordance table of heading number and serial number the desired card can easily be obtained.



537.311.33 : 546.289 : 535.215

Large-signal surface photovoltage studies with germanium.

E.O.Johnson

Phys.Rev., 111, (No.1), 153/166, 1958.07.01

The studies were carried out over a wide range of excess-carrier densities. Ambient-induced inversion and accumulation layer surfaces were studied on p-type and n-type Ge. The results agree with the theory that considers the surface space charge, but neglects charge changes in fast surface states.

A 7 : 105 x 74 mm
International catalogue card : 125 x 75 mm
A 6 : 148 x 105 mm

Fig. 1

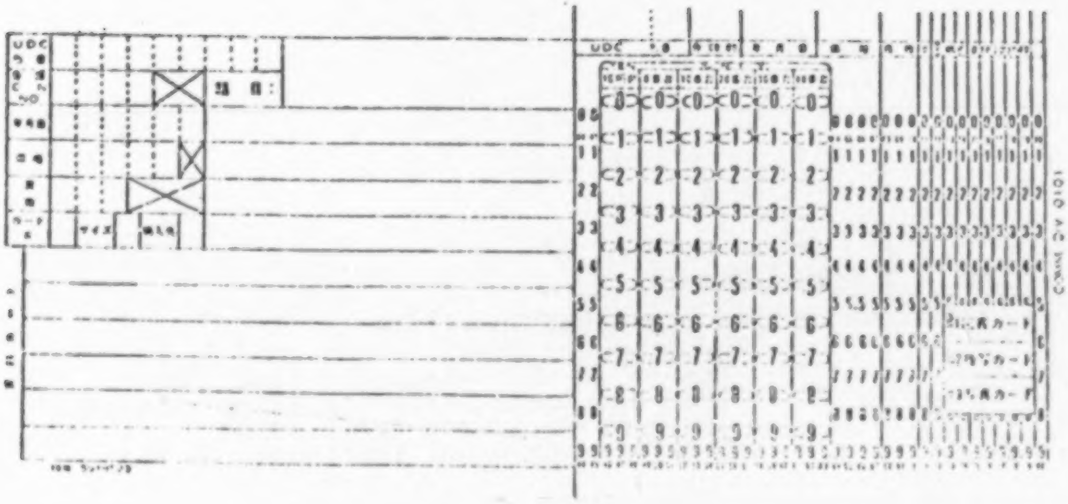


Fig. 2

⑤ ①
338 338 : 669.1
② Iron and Steel Institute
The Iron and Steel Industry of Japan
⑥ ③ Report of the Delegation from The
1 Iron and Steel Institute which visited
Japan in March and April 1963
12345 ④ (The Iron and Steel Institute, SR 85)
⑦

⑧ The Inst., London, 1963
28.5cm, 130p

700723US7500

Fig. 3

Notes: (1) classification numbers,
(2) name of author or editor,
(3) title,
(4) series title,
(5) classification label } call number
(6) book number,
(7) number of original register,
(8) imprint, collation,
(9) date of processing, receive classification,

338 A

338 338 : 669.1
Iron and Steel Institute
The Iron and Steel Industry of Japan
Report of the Delegation from The
1 Iron and Steel Institute which visited
Japan in March and April 1963
12345 (The Iron and Steel Institute, SR 85)

The Inst., London, 1963
28.5cm, 130p

700723US7500

Fig. 4

669.1 B

338 1

12345

338 : 669.1
Iron and Steel Institute
The Iron and Steel Industry of Japan
Report of the Delegation from The
Iron and Steel Institute which visited
Japan in March and April 1963
(The Iron and Steel Institute, SR 85)

The Inst., London, 1963
28.5cm, 130p

700723US7500

Fig. 5

Iron and Steel Institute

338 1

12345

338 : 669.1
Iron and Steel Institute
The Iron and Steel Industry of Japan
Report of the Delegation from The
Iron and Steel Institute which visited
Japan in March and April 1963
(The Iron and Steel Institute, SR 85)

The Inst., London, 1963
28.5cm, 130p

700723US7500

Fig. 6

Iron and Steel Industry of Japan

338

1

12345

338 : 669.1
Iron and Steel Institute
The Iron and Steel Industry of Japan
Report of the Delegation from The
Iron and Steel Institute which visited
Japan in March and April 1963
(The Iron and Steel Institute, SR 85)

The Inst., London, 1965
28.5cm, 130p

700723US7500

Fig. 7

Iron and Steel Institute, SR 85

338

1

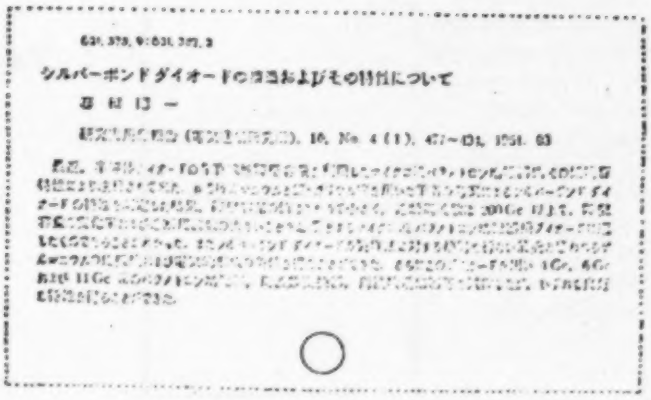
12345

338 : 669.1
Iron and Steel Institute
The Iron and Steel Industry of Japan
Report of the Delegation from The
Iron and Steel Institute which visited
Japan in March and April 1963
(The Iron and Steel Institute, SR 85)

The Inst., London, 1965
28.5cm, 130p

700723US7500

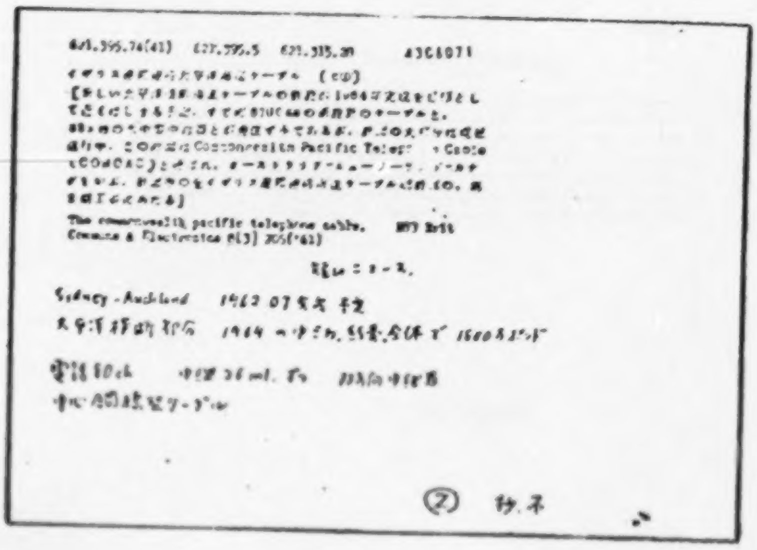
Fig. 8



621.375.9:621.397.3

シルバーボンドダイオードの製造およびその特性について

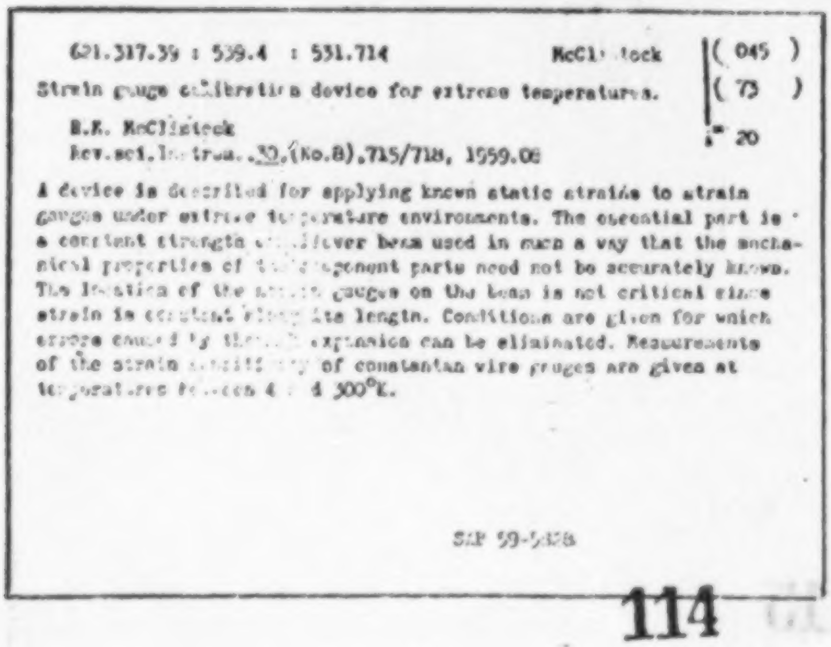
Fig. 9



The commonwealth pacific telephone cable. Brit Commun & Electronics 9[3] 205('62)

Sydney - Auckland 1962

Fig. 10



621.317.39 : 539.4 : 531.714 McClintock

Strain gauge calibration device for extreme temperatures.

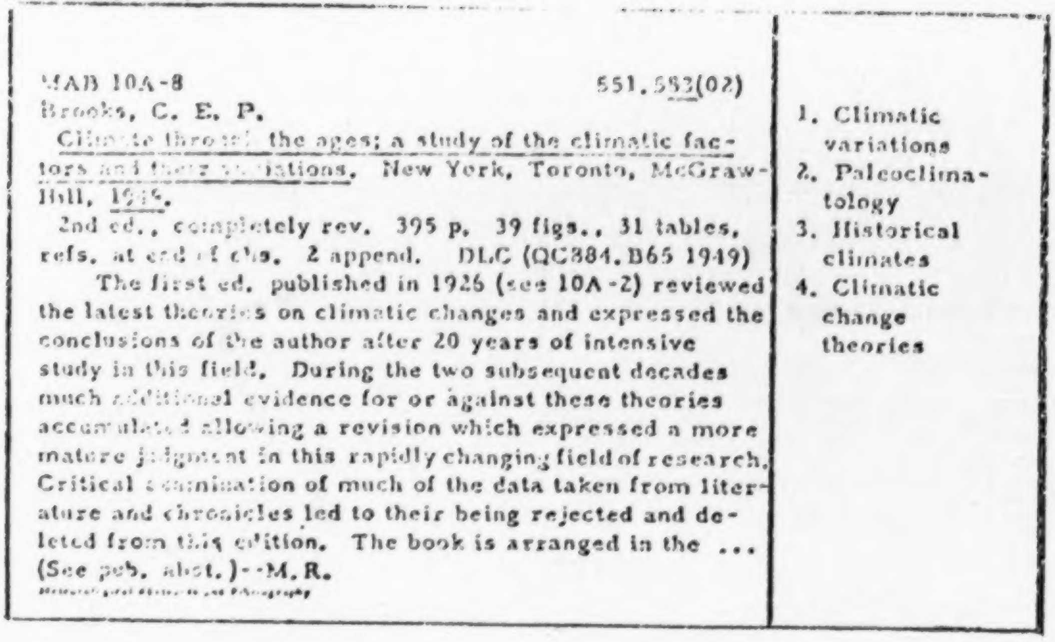
R.K. McClintock
Rev.sci.Instrum. 30 (No.8).715/718, 1959.08

(045)
(73)
20

A device is described for applying known static strains to strain gauges under extreme temperature environments. The essential part is a constant strength cantilever beam used in such a way that the mechanical properties of the component parts need not be accurately known. The location of the strain gauges on the beam is not critical since strain is constant along its length. Conditions are given for which errors caused by thermal expansion can be eliminated. Measurements of the strain sensitivity of constantan wire gauges are given at temperatures between 4 and 300°K.

SAP 59-5828

Fig. 11



MAB 10A-8 551.583(02)
Brooks, C. E. P.
Climate through the ages; a study of the climatic factors and their variations. New York, Toronto, McGraw-Hill, 1949.
2nd ed., completely rev. 395 p. 39 figs., 31 tables, refs. at end of chs. 2 append. DLC (QC884.B65 1949)

The first ed. published in 1926 (see 10A-2) reviewed the latest theories on climatic changes and expressed the conclusions of the author after 20 years of intensive study in this field. During the two subsequent decades much additional evidence for or against these theories accumulated allowing a revision which expressed a more mature judgment in this rapidly changing field of research. Critical examination of much of the data taken from literature and chronicles led to their being rejected and deleted from this edition. The book is arranged in the ... (See pub. abst.)--M.R.

1. Climatic variations
2. Paleoclimatology
3. Historical climates
4. Climatic change theories

Fig. 12

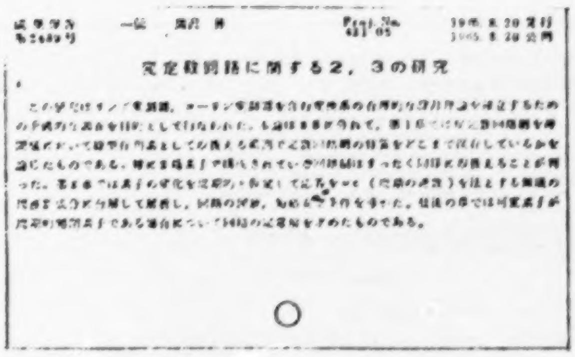
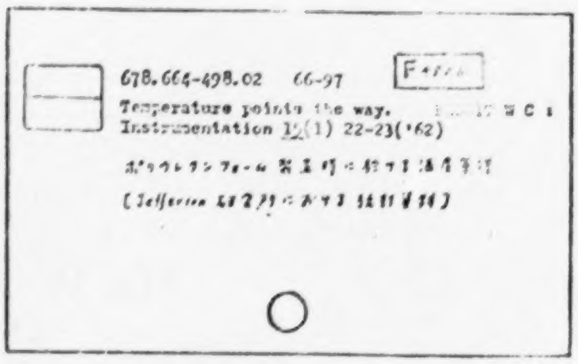
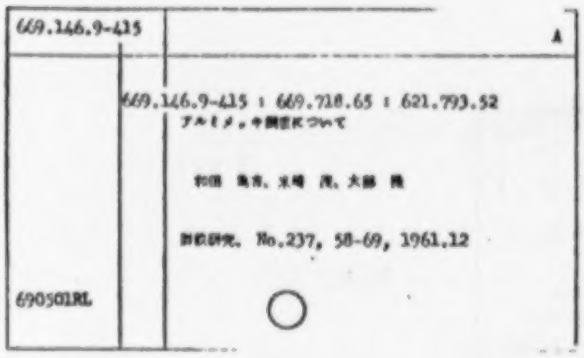


Fig. 13



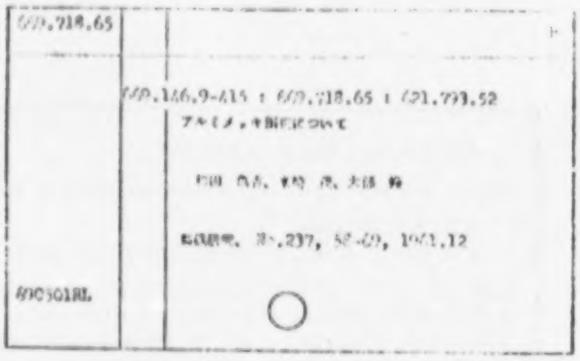
678.664-498.02 66-97
Temperature points the way.
Instrumentation 15(1) 22-23('62)

Fig. 14



669.146.9-415
669.146.9-415 : 669.718.65 : 621.793.52
No.237, 58-69, 1961.12
690501RL

Fig. 15



669.718.65
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No.237, 58-69, 1961.12
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Fig. 16

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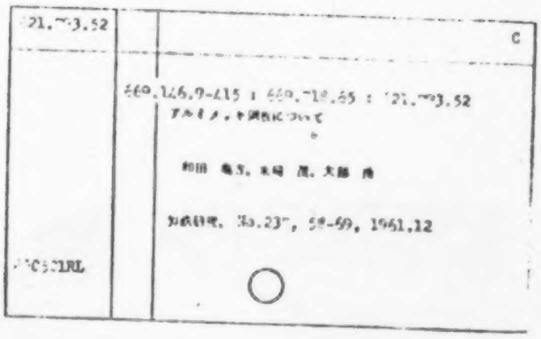

621.793.52

C

669.146.9-415 : 669.718.65 : 621.793.52

アルミナ，[illegible]について

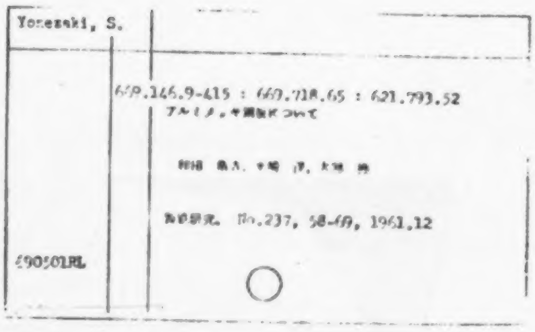
和田 亀吉, 米崎 茂, 大[illegible]

製鉄研究, No.237, 58-69, 1961.12

690501RL

○

Fig. 17


Yonezaki, S.

669.146.9-415 : 669.718.65 : 621.793.52

アルミナ，[illegible]について

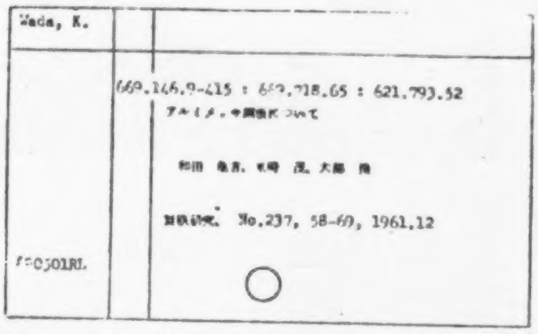
和田 亀吉, 米崎 茂, 大[illegible]

製鉄研究, No.237, 58-69, 1961.12

690501RL

○

Fig. 18


Wada, K.

669.146.9-415 : 669.718.65 : 621.793.52

アルミナ，[illegible]について

和田 亀吉, 米崎 茂, 大[illegible]

製鉄研究, No.237, 58-69, 1961.12

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Fig. 19

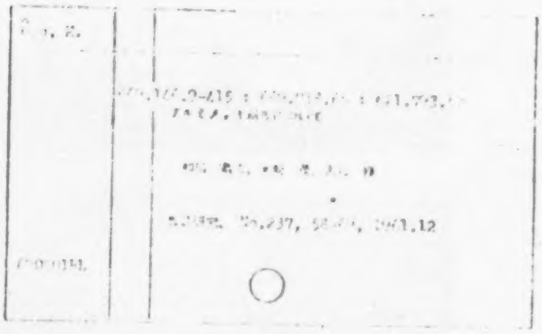
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Fig. 20

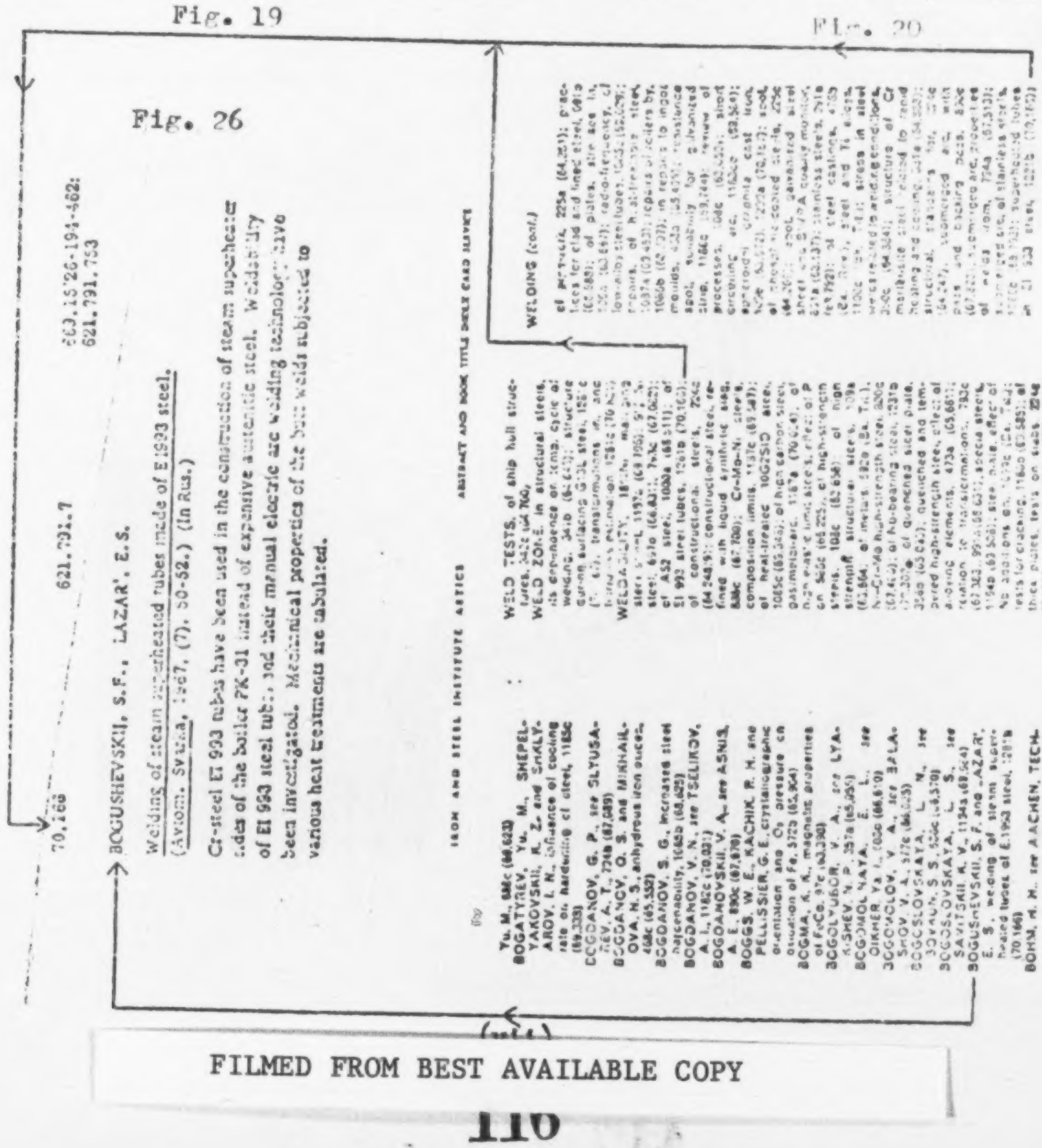
Fig. 26

70,166 621.791.7 669.15'26-194-462:
621.791.753

BOGUSHEVSKII, S.F., LAZAR', E.S.

Welding of steam superheated tubes made of EI993 steel.
(Avtom. Svarka, 1967, (7), 50-52.) (In Rus.)

Cr-steel EI 993 tubes have been used in the construction of steam superheater tubes of the boiler PK-31 instead of expensive austenitic steel. Weldability of EI 993 steel tubes and their manual electric arc welding technology have been investigated. Mechanical properties of the butt welds subjected to various heat treatments are tabulated.

IRON AND STEEL INSTITUTE ABSTRACT AND BOOK TITLE INDEX CARD SERVICE

Yu. M., 686c (66,623)
BOGATYREV, Yu. M., SHEPELYAKOVSKII, K. Z. and SHALYAROV, I. N., influence of cooling rate on hardening of steel, 1185c (69,339)
BOGDANOV, G. P., see SLYUSAREV, A. T., 734b (67,089)
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BOGDANOV, S. G., increased steel hardenability, 1065b (68,625)
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BOGUSHEVSKII, S. F. and LAZAR', E. S., welding of steam superheated tubes of EI953 steel, 1281b (70,166)
BOHM, H. H., see AACHEN, TECH-

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WELD ZONE, in structural steels, its dependence on temp. cycle of welding, 341b (64,643); structure during surfacing G13L steel, 1261c [illegible]; transformations in, and [illegible] estimation 1261c (70,[illegible])
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SUBJECT INDEX

(cont.)

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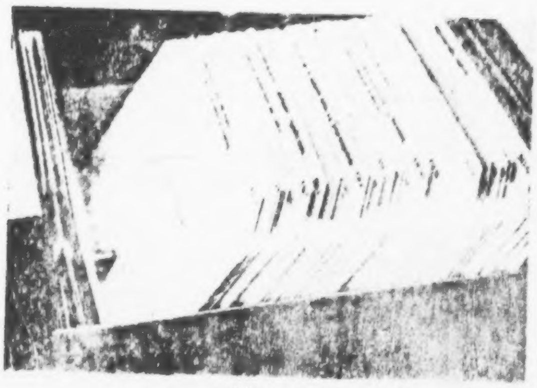

Fig.21

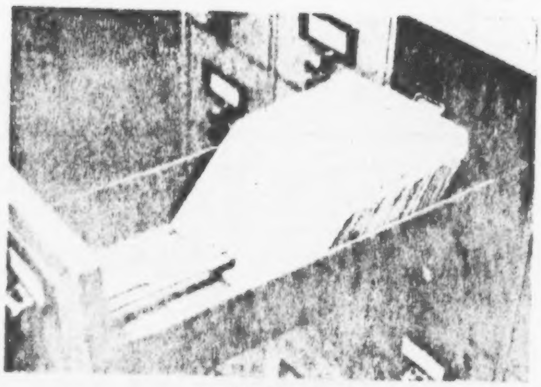

Fig.22

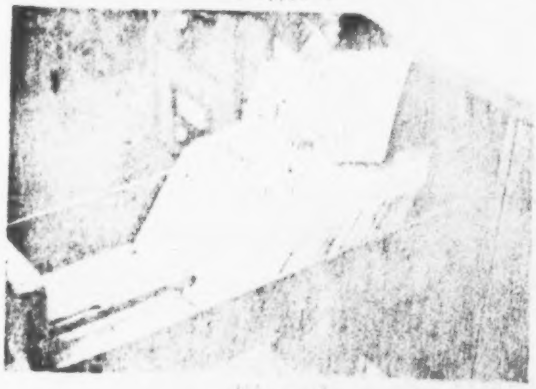

Fig.23

Fig.24

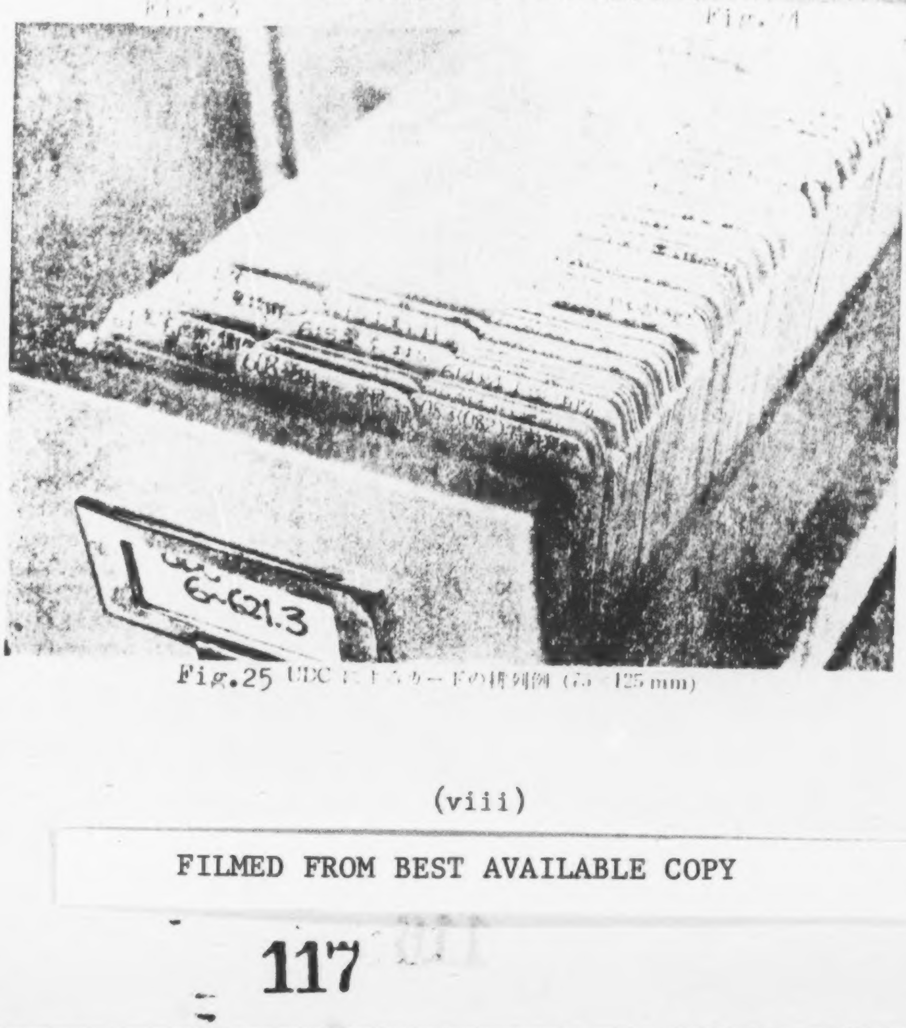

Fig.25 UDCによるカードの排列例 (75×125 mm)

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Distribution: limited

DOCTEC/LEC/3
Tokyo, 14 July 1970

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

FILES ALPHABETICAL ARRANGED BY TERMS

Miss Mieko Nagakura
National Institut for Educational Research of Japan

Construction of this lecture:

I. Information-retrieval systems

II. Entry forms of subject heading (input operation)

III. References and scope notes (input operation and auxiliary conjunction)

IV. Filing rules (input operation)

V. Searching techniques (output operation)

VI. Library techniques vs. documentation

I. INFORMATION-RETRIEVAL SYSTEMS

"The most fundamental objective of information retrieval is to help Man make fullest use of the knowledge he discovers and records".

Samples to be used as conventional system:

Library of Congress Subject Headings. 7th ed. Washington, 1966.

ALA Rules for Filing Catalog Cards. 2nd ed. Chicago, 1968.

Operational areas of an ideal information-retrieval system;

(1) input (analysis, encoding, and storage of documents)

(2) output (searching, identifying, and delivery operations)

(3) auxiliary conjunction (maintaining consistency between input and output)

II. ENTRY FORMS OF SUBJECT HEADING

A. Noun (Single word)

e.g. Aeronautics, Botany

B. Compound heading (Words linked by "and", expressing overlapping concepts)

e.g. Maps and Charts, Maintenance and Repair

C. Adjectival heading (Phrases of two or three words)

e.g. Naval aviation, Airport buildings, Traffic control center

D. Phrase (Compound phrases)

e.g. Electronics in aeronautics, Packing for shipment

E. Qualified heading (Words followed by a note in parentheses to distinguish between terms with the same spelling, but different meanings)

e.g. Pitch(frequency), Pitch(inclination), Pitch(material)

F. Inverted heading (Inversion is used when the grouping of a related set of entries is considered desirable)

e.g. Chemistry, inorganic
Chemistry, organic
Chemistry, technical

Airplanes
Airplanes, cargo
Airplanes, convertible
Airplanes, experimental
Airplanes, light

G. Corporate and personal names

In the LC list, these names, with other names such as places, regions, natural features, structures, chemical compounds, systematic names of families, genera, and species in botany and zoology, and etc., are omitted.

When these names are used in catalog, entry forms should be identical with those forms used as main entries.

H. Entry with subdivisions

1. Subheading

e.g. Airlines
- Certification
- Flying equipment
- Ground equipment
- History
- Management
- Regulations
- Schedules

Gold (metalurgy)
- alloys
- coating
- extraction
- fabrication
- plating
- refining
- separation

2. Regional division (Local subdivision)

e.g. Geology - California
- Rocky Mountaines
- Russia - Volga Valley

(indirect)

Taxation - London
- Paris
- Tokyo

(direct)

3. Subdivisions of a place

e.g. U.S. - Industries
not Industries - U.S.

Boston - Libraries
not Libraries - Boston
but Libraries - U.S.

4. Form subdivision
Used under any subject heading as required.

e.g. Abstracts
Addresses, essays, lectures
Bibliography
Bio-bibliography
Case studies
Collected works (a work on one object, e.g. Science - ...)
Collections (a work on collections of objects)
Congress
Dictionaries
Directories
Exhibitions
Film catalogs
Handbooks, manuals, etc.
History(usually followed by period subdivision)
Indexes
Outlines, syllabi, etc.
Periodicals
Societies, etc.
Statistics
Study and teaching
Yearbooks

5. Period subdivision

e.g. Blast-furnaces - History - 1870-1964

To divide arbitrarily a large file by date of publication
Aeronautics - Early works to 1900

III. REFERENCES AND SCOPE NOTES

Conventional library ways of maintaining consistency between the input and output operations.

A. Scope notes

In the LC list, scope notes are liberally interspered.

The are used to ensure consistency of subject usage,
by specifying the range of subject matter to which a heading is applied,

by drawing necessary distinctions between related headings,
by stating which of several meanings of a term is the one to which its use in the file is limited.

B. References

"See" reference

Direct the reader (indexer) to preferred synonymous terms, and lead the user from his subject to the terms employed in the system.

e.g. Oscillation
x beat
nutation
pitching
pulsation
rolling
swing
undulation
vibration

Lighting
x illumination

Time
x duration

Roughness
x Roungh, smoothness

Hot
see Heat

Rough
see Roughness

Pour
see Pouring

Bicycles
x Bycycle

Dyes
x Dye

Pumps
x Pump

Solvents
x Solvent

Beewax

Installing

Purity

"See also" reference

Brings related headings together, and directs the user to more specific subjects or topics, and to applications of the subjects.

General —— Specific

A ----- B
coordinate

One rule generally followed in conventional lists is to refer from a larger to a smaller subject or from a general to a specific subject, but not backward.

e.g. Amines
see also Hydrazine (NT)
Melamine (NT)
Urea (NT)

Hydrazine
see also Amines (BT)
Melamine
s.a. Amines (BT)
Urea
s.a. Amines (BT)

Dyes
x gentian violet (NT)
sulfer colors (NT)
vat colors (NT)
Gentian violet
see Dyes (BT)
Sulfer color
see Dyes (BT)
Vat color
see Dyes (BT)

Purity
s.a. Cleaning (RT)
Contamination (RT)
Pollution (RT)
Purification (RT)
Quality (RT)

Solvents
s.a. Cleaning compounds (RT)
Dispersants (RT)
Extenders (RT)
Extraction (RT)
Leaching (RT)
Solubility (RT)
Solutions (RT)

BT = broader terms NT = narrower terms RT = related terms

IV. FILING RULES (Arrangement of searching clues)

Basic form of arrangement:

Systematic arrangement
Usually has a serial code to aid filing in subject sequence, e.g. UDC.

Alphabetical arrangement
a. Dictionary catalog (Author, Title, Subject, Series, etc.)
Orthodox way of filing in library field.

b. Divided catalog (Author-Title; Subject)
Exceptional way of filing.
Newer development.
Preferable in science and technology field

Alphabetical arrangement:

Whatever the language, its alphabet has a fixed order of arrangement, comprises a kind of numerical system.

Provides an automatic way of arranging various portions of the language for ready retrieval.

Basic principle and basic order:

BASIC PRINCIPLE
"Filing should be straightforward, item by item through the entry, not disregarding or transposing any of the elements, nor mentally inserting designations..."

BASIC ORDER

1) Word by word
"The basic order is alphabetical, word by word, except in certain areas where a numerical or chronological arrangement is preferable"

e.g. Book
Book collecting
Book of English essays
Bookbinding
(word by word)

Book
Bookbinding
Book collecting
Book of English essays
(letter by letter)

2) Order of entries

"When the same word, or combination of words, is used as the heading of different kinds of entry, the entries are arranged alphabetically word by word, disregarding kind of entry, form of heading, and puctuation, except that personal surname entries are arranged before other entries beginning with the same word or combination of words".

e.g. London, Jack, 1876 - 1916
LONDON, JACK, 1876 - 1916
London (author)
The case of the city of London
London; a guide to the public building... (title entry)
LONDON
Harrison, Frederic
London (title)
Johnson, Samuel
LONDON
Loftie, William

Subject arrangement:

After personal surnames, subject entries are interfiled with title entries.

1) Identical subject entries -- Subarrangement

by the main entry
by the title
by the edition (or imprint date)

2) Basic order -- alphabetical arrangement

Disregard puctuation, all form, subject, and geographical subdivisions, inverted subject headings, phrase headings, etc.

Only exception is period subdivisions, which are arranged chronologically after the subject without subdivisions.

Group arrangement ("class order" by Cutter, or group plan in LC) now abandoned. In ALA Filing Rules, no reference made to this arrangement.

e.g. EDUCATION
EDUCATION -- 1945-
EDUCATION -- 1945- CONGRESSES
EDUCATION -- AFRICA
EDUCATION -- AIMS AND OBJECTIVES
EDUCATION, ANCIENT
EDUCATION AND STATE
Education and American civilization
EDUCATION -- COLLECTIONS
EDUCATION -- EARLY WORKS TO 1800
EDUCATION OF CHIDREN
Education through art
EDUCATION -- U.S.
EDUCATION -- U.S. -- 1945-
EDUCATION -- U.S. -- 1945- ADDRESSES, ESSAYS, LECTURES, ETC.
EDUCATION -- U.S. -- ADDRESSES, ESSAYS, LECTURES, ETC.

V. SEARCHING TECHNIQUES

Searching process:

1. To analyse a question.
2. To select clues (characteristics) from the question presumed to be useful in searching.
3. To transform these clues into the forms (subject headings, keywords, etc.) used in the information file.
4. To match or identify the clues of question with those in the file.

"Output" processes is same as those for "input".

Conventional searching vs. machine searching:

e.g. Title of document: "Development of Die Lubricants for Forging and Extruding Ferrous and Nonferrous Materials".

Question: "Select documents on all aspect of the forging of magnesium".

Conventional Subject Headings	Clues in Machine System	Clues from Question
Metals -- Extrusion	Die	Forging
Dies -- Lubrication	Lubricant	Magnesium
Lubricants -- Development	Forging	
	Extruding	
	Ferrous material	
	Nonferrous material	
	Aluminum	
	Titanium	
	Magnesium	
	Steel	

Points of significance -- 1. Coordination 2. Number of searching clues
3. Partial matching vs. full matching

Virtues and defects of "subject file arranged alphabetically":

1. Virtues
   a. Search-ready system
   b. Natural language (no encoding, any one can use)
   c. Directness (group selection instead of coordination)

d. Natural order (fixed order of alphabet)

e. Expandability (results in high cost of maintenance)

2. Defects

(a) arbitrarity and (b) artificial decisions in the processes of selection of terms and combination or formation of selected terms into subject headings.

VI. LIBRARY TECHNIQUES VS. DOCUMENTATION

"Documentation is simply an extended form of traditional librarianship".

Library techniques are serving as a springboard from which researchers are seeking more advanced techniques to cope with emarging requirements for more subtle and detailed access to information.

Documentation is an attempt to resolve the difficulties in the traditional library tools.

e.g. 1. Coordinate indexing
(Uniterm, Peek-a-boo, Batten systems)
A method of coordinating concepts as a combination rather than a permutation.
Developed to avoid the artificial decisions during the process of forming terms into subject headings, and to economize the high cost of maintaining conventional permutation files.

2. Permuted or KWIC (Key-Word-In-Context) index
A method to use natural language (title, etc.) as indexing words, and to avoid the arbitrarity in the selection of Keywords.
Retains alphabetical arrangement.

3. Concept-coordination
Introduction of "link" and "role" into keyword system to minimize false drops of the retrieved information.
Some application of phrase and qualified headings.

4. Thesaurus
A new form of alphabetic listing of standard indexing terms.
Developed to provide more access points for the information search than subject heading.

a) More detailed terms than subject headings

b) Direct entries, avoiding inverted phrases

c) No subdivision

d) Extensive use of cross references

Distribution: limited

DOCTEC/LEC/4
Tokyo, 16 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

PUNCHED CARDS

Shigeo Nakamura

Chief Consultantant, Gaikoku Bunken Sha

1. Punched card in documentation

Almost users of punched cards in documentation apply these systems and tools for information retrieval, though some of them use the punched cards for editing bibliography or lists.

Punched cards especially hand sort punched cards have these functional posibilities.

1) Sorting
2) Selecting
3) Sequential sorting

Sorting capability is often used in bussiness paper work.

Selecting capability is very important in documentation, especially in information retrieval.

Sequential sorting capability is a special sorting technique and is often used in editing some lists, for example alphabetical list of authors in documentation.

2. Hand sort punched cards

Hand sort punched cards may be obtained in various sizes.

Most popular sizes in commercial products are

6 x 4 inches
7 x 5
8 x 5
8 x 6
$8\frac{1}{4} \times 5\frac{3}{4}$
10 x 7

The sizes of holes are

4 holes / inch
5 holes / inch and

some are 6 holes / inch

$2 \text{ holes} / \text{cm} = 5^{\text{holes}} / 2.5^{\text{cm}}$

Rows of holes are 1 - 3 generally.

3. Coding and operation

3-1 Direct coding

Direct coding is the simplest form. A seperate meaning is arranged to each hole.

3-2 Combination coding

3-2-1 Non Selective coding

The typical numerical coding is shown in fugure 1

Fig. 1

```
 ____________
 0  0  0  0
 7  4  2  1
```

1 = 1
2 = 2
3 = 2 + 1
4 = 4
5 = 4 + 1

6 = 4 + 2
7 = 7
8 = 7 + 1
9 = 7 + 2
0 = Non Punch

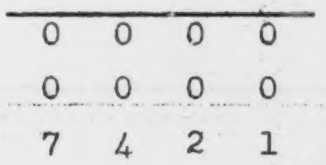
This coding is used in arranging the cards into numerical order by sorting or in grouping the cards.

This coding is not so often used in information retrieval because it is non selective.

3-2-2 Selective coding

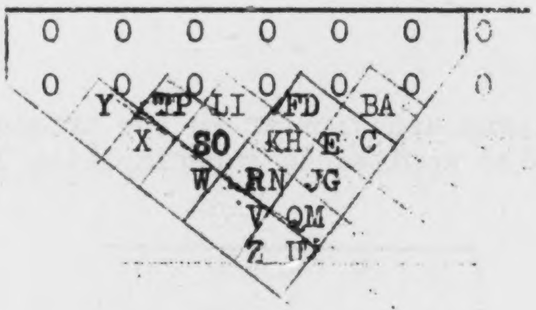
322.1 Numerical code

Fig. 2


0 0 0 0
0 0 0 0
7 4 2 1

322.2 Alphabetical code

Fig. 3


0 0 0 0 0 0 0
0 0 0 0 0 0 0
Y
TP
LI
FD
BA
X
SO
KH
E
C
W
RN
JG
V
QM
Z
U

3-2-3 Superimposed code

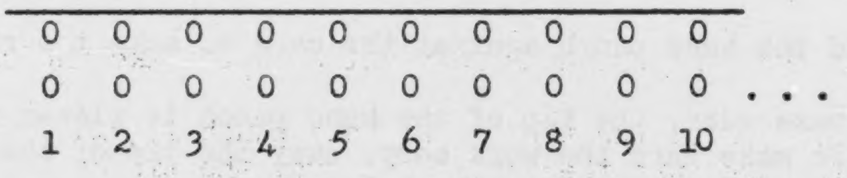
In non selective coding or selective coding, when we punch two or more meanings in a field, false drop increases apparently.

So, when it will happen to punch many items in a field, we use superimposed coding.

There are three examples of superimposed coding.

Example 1: ASM-SLA Type

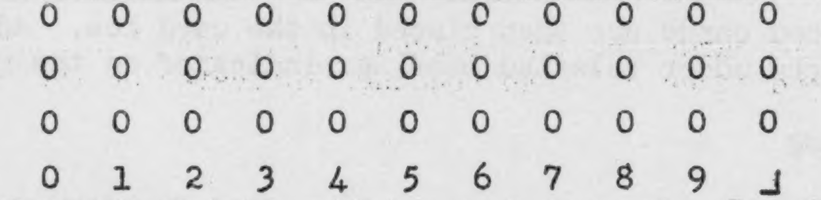
Fig. 4


0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 . . . .
1 2 3 4 5 6 7 8 9 10

Deep holes are arranged for divisions, and shallow holes for subdivision.

Example 2: For UDC

Fig. 5


0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
0 1 2 3 4 5 6 7 8 9 ⅃

In this coding, intermediate punch is used. So, the operation is different from regular one.

Example 3: Random code

Fig. 6

```
0 0 0 0 0 0 .............. 0 0 0 0
1 2 3 4 5 6                ..... (n-1)n
```

Four figures are selected at random, and the combination of four figures are coded.

3-2-4 Square coding

The punching paterns are similar to the triangle coding, but it is easier to code, and also applied to superimposing like ASM-SLA type.

Fig. 7

0	0	0	0	0
0	0	0	0	0
D	C	B	A	▨
H	G	F	▨	E
L	K	▨	J	I
P	▨	O	N	M
▨	T	S	R	Q

4. Operation of hand sort punched cards.

4-1 Punching

1) Hold the hand punch against the card to make the right angle.

2) To make sure, the tip of the hand punch is placed on the corresponding hole. To make sure the work easy, sway the tip of the hand punch a little bit, so that it right fits the hole.

3) When mispunched, use the saver piece.

Moisten the back of the piece, and fold and stick it to cover the both sides of the card. And punch anew.

4) Punched cards are then placed in the card bon. Adequate number of cards are grouped under selected headings indicater on the guide cards.

4-2 Sorting

1) Take out a group of cards to be sorted from the drawer. Adequate number of cards for sorting at one time is not more than 150.

2) Place the cards on the sorting tray and push them against the side upright plate.

3) Check the corner cut and make sure that no exception is found.

If, found, pick it out and place it in the same direction of the other cards.

4) Hold the main sorter and push it through the target hole as far as it can go. In this case hold the cards but not to firm with your empty hand as close as the hole.

5) Slide the hand down to the corner part of the cards, to hold them loose.

6) Next, push the cards gently away so that the sorter can be hold horizontally.

7) Then turn the point of the sorter to the right direction as far as it can go.

8) Grasp the cards firm, and turn the sorter point to the original direction.

9) Finally, hold the cards upright position.

During this process, don't forget to hold the cards firm.

10) Pull up the whole cards a few inches above, using the both hands at the same time.

11) Hold the sorter in horizontal position, and take your another hand off the cards.

12) To make sorting sure, swing the sorter up and down a few times and pull it up to the upper right direction.

13) Place the dropped cards on the card rack.

4-3 Sequential sorting

To arrange the cards in numerical order, start with the shallow hole and place the dropped cards to the back of the remained cards.

Repeat the same on the hole 2, 4 and 7 respectively, each time placing the dropped cards to the back of the rest.

As a result, you find cards are arranged 0 - 9 at the first digit.

Now, make the sequential sorting for the second digit.

When the total numbers to be processed surpasses the number to be handled at one time on the sorting tray, first dived into the smaller groups, say by hundreds and then start to make exact sorting for each cards of 100 in number.

5. Superimposing

In hand sort punched cards used in information retrieval, most of the coding systems are made up by the combination of holes.

It is imposible to punch out more numbers of items than theoretical numbers of combinations of holes.

In documentation, especially in information retrieval, "To select the document wanted" means "To reject unwanted document".

Are we allowed to say "False drop (or moise) may be **permitted**, if it is not so much."?

Here, superimposed coding may be used in practice.

5-1. Two or more meanings in a field.

As described in 323. Example 3 when two are more more meanings or items are punched, what will happen?

Fig. 8

```
              "10"                                  "1"
 ___________________________________________________________
 o  o  o  o  o  o  o  o  o  o  o  o  o  o  o  o  o  o  o  o
 o  1  2  3  4  5  6  7  8  9  o  1  2  3  4  5  6  7  8  9
```

In fig. 8, we can punch oo -- 99.

Now, 34 and 56 are punched, this card drops when sorted in 34, 56, 36, and 54.

And if there is a card punched "36 and 54", the card can not be separated by a sorter with the card punched "34 and 56".

So we should check the description on the cards which are selected by sorting.

5-2. Superimposed coding for subdividing

Fig. 9

```
 ____________________________________________
 o  o  o  o  o  o  o  o  .  .  .  .  .  o  o
 A  B  C  .  .  .                       Y  Z
```

In Fig. 9, Authors name, for example "Nakamura", is expressed by punching "N". When the cards are sorted, the numbers of 1/26 of total cards will be selected.

If "N" and "A" are punched and the cards are sorted, the cards, not only "Na" but also "An", for example "Mr. Andrews", will come down.

Here, the numbers of the dropping cards are approximately $(2/26)^2 = 1/169$ of the total cards.

The critical numbers to punch is said 1/2.7 of total numbers of the holes.

6. Machine Card Selector

There was a period during which IBM sorter or colator had been used in information retrieval.

Electronic computer systems were developed for many activities in documentation.

In Japan, applications of electronic computers are increasing. Information retrieval by computers are studied and in some cases. They are running for documentation. But many organizations also use machine card selectors which were developed in Japan.

Machine card selector which is developed for information retrieval has a capability of logical programing for

1.	Conjunction	(and)
2.	Disjunction	(or)
3.	Negation	(not)

In "question and answer system" the questions are complex.

F.R. whaley gave the examples of search questions employing logical relations as shown in Table 1.

(Am. Doc. Inst. meeting 1959)

Table 1

Type	Logical expression	Example
1	A	Information on γ-aminoprophyltrichlorosilane
2	A+B+ ...	Information on any aminoalkyltrichlorosilane
3	A.B	Refractive index of ferrocene
4	A.B.C ...	Cost estimates of equipment for engine testing
5	A.(B+C+...)	Disproportionation of metallic subhalides
6	(A+B+...) (Q+R+...)	Any thermodynamic properties of ferrocene or its derivatives
7	A.B ... (Q+R+ ...)	Heat of formation of any one of a group of chemicals
8	A(B+C+ ...) (Q+R+ ...)	Viscosity as a function of temperature or shear in dimethylsilicone oils
9	(A+B+ ...) (Q+R+ ...) (X+Y+ ...)	Any of various clay minerals compared directly with any zeolites for either adsorptive or catalytic uses
10	A-A.B	Preparation of a chemical not using a Grignard reagent
11	A.B-A.B.C	The reaction of two chemicals where a third chemical is definitely not formed

7. Coding in Machine Selector

7.1 Direct coding

IBM card has 80 colums and 12 rows in one colum of its punching position. So, there, we can code 80 x 12 = 960 of direct code.

Table 2. Shows an example of direct code of chemical compounds.

Table 2 - 1

Row	Column 32 Elements	Column 34 Structure	Row	Column 36 Code Units	Column 36 Miscellaneous	Row
0	O	Acyclic	0	12 or more	Solid	0
1	N	Alicyclic	1	1	Liquid	1
2	S	Aromatic	2	2	Gas	2
3	F	Heterocyclic	3	3	Organo-metallic	3
4	Cl	Fused Alicyclic	4	4	Isotopic	4
5	Br,I	Fused Aromatic	5	5	Indeterminate	5
6	P,Bi	Fused Heterocyclic	6	6	Solution	6
7	As,Sb		7	7	Polymer	7
8	Si,Ge	3 or 4 Member Ring	8	8	Chelate	8
9	Sn,Pb	5 Member Ring	9	9	Hydrate	9
X	B,Al	6 Member Ring	X	10	KBr Plate	X
Y	Other	7 or more Member Ring	Y	11		Y

Row	Column 33 Unsaturation	Column 35 Rings-Chains	Row	Column 37 Substitutions	Column 39 Miscellaneous	Row
0	Ring	Rings	0	(mono)	cis	0
1	1	1	1	1 (1,2)	trans	1
2	2	2	2	2 (1,3)	spiro	2
3	3	3	3	3 (1,4)	dextrorotary	3
4	4	4	4	4 (1,2,3)	levorotory	4
5	5	5	5	5 (1,2,4)	symmetrical	5
6	6	6	6	6 (1,3,5)	symmetrical	6
7	7	7	7	7 (1,2,3,4)	vicinal	7
8	8	8	8	8 (1,2,4,5)	Salt	8
9	9	9	9	9 (1,2,3,5)	Inorganic Ester	9
X	$-\overset{\backslash}{C}=\overset{\backslash}{C}-$	10	X	10 (penta)		X
Y	$-C\equiv C$	11 or more	Y	(hexa)	Inorganic	Y

Table 2-2

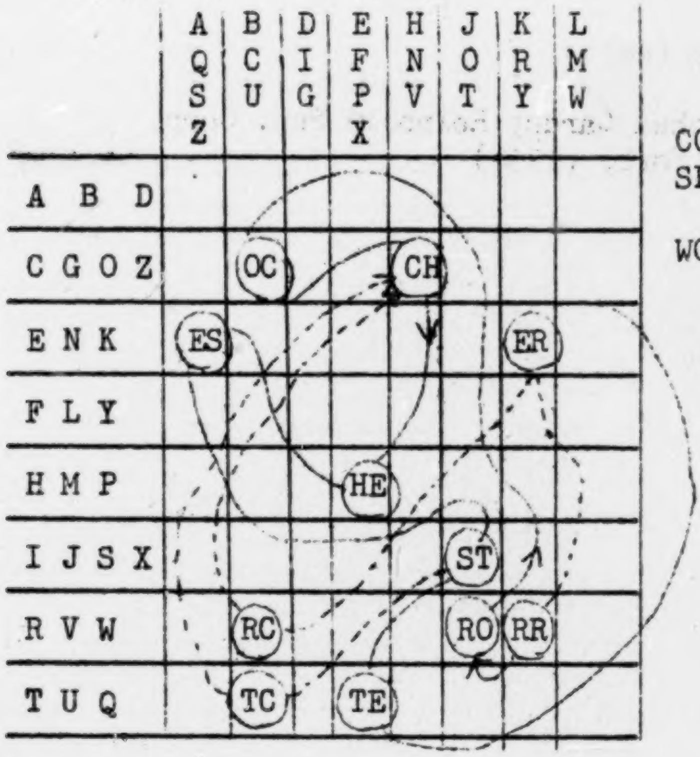
Row	Column 40 C - H	Column 42 O	Column 44 N	Row	Column 46 S	Column 48 N - O	Row
0	-CH3 methyl	-C(=O)OH	-C(=N)N	0	-C(=S)S-	>NC(=O)O- -OC(=N)O-	0
1	-C2H5 ethyl	-C(=O)O-	>NC(=N)N<	1	-C(=S)H	>NC(=O)N< -OC(=N)N<	1
2	-C3H7 n-propyl	-C(=O)H	-CN	2	>C=S	-C(=O)N< -C(=N)O-	2
3	-C3H7 iso-propyl	>C=O	-NC	3	-SC(=S)S-	-NCO	3
4	-C4H9 n-butyl	-OC(=O)O-	-NH2	4	-SH	-OCN	4
5	-C4H9 iso-butyl	C(OR)4	>NH	5	-S-	>NNO2	5
6	-C4H9 sec-butyl	-C(OR)3	>N-	6	-SS-	>NNO	6
7	-C4H9 ter-butyl	-OH	C=N-	7	R3S^{+}	-NN(=O)-	7
8	-C5H11 n-pentyl	- O -	=NN= >NN<	8	=S=S	-ONO2	8
9	-C6H5 phenyl		-N=N- =N≡N	9		-ON=O	9
X		Other	Other	X	Other	Other	X
Y		Hetero-cyclic	Hetero-cyclic	Y	Hetero-cyclic	Hetero-cyclic	Y

Row	Column 41 C - H	Column 43 O	Column 45 N	Row	Column 47 S	Column 49 N - O	Row
0	-CM-CH2 vinyl	R3O^{+}	-N=N-N<	0		-NO2	0
1	>C=CH2 ter.methylene	-O3-	-N≡N^{+}	1		-NO	1
2	=CHCH3 ethylidene	>C(-O-)2	R4N^{+}	2		=NO- >NO-	2
3	-CH2CH=CH2 allyl		-NH4	3		≥N=O	3
4	-CH=CHCH3 propenyl		>NCN	4			4
5	-C(CH3)=CH2 isopropenyl		-N3	5			5
6	=C(CH3)2 isopropylidine			6			6
7	-C≡CH ethynyl			7			7
8	-C≡CCH3 1-propynyl			8			8
9	-CH2C≡CH 2-propynyl			9			9
X	Conjugated	Conjugated	Conjugated	X	Conjugated	Conjugated	X
Y				Y			Y

7.2 Superimposed coding

7.2.1 Alphabectical code

H.P. Luhn developed superimposed coding for terms on IBM card. An example is shown in figure 10.


A Q S Z
B C U
D I G
E F P X
H N V
J O T
K R Y
L M W
A B D
C G O Z
E N K
F L Y
H M P
I J S X
R V W
T U Q
OC
CH
ES
ER
HE
ST
RC
RO
RR
TC
TE

COMPLETE
SPELLING

WORDS ENCODED:

CHEST
CHESTER
ROCHESTER

7.2.2 U.D.C.

Let us design a IBM card for U.D.C. equivalent to the hand sort punched card that were used in our practice.

Table 1: P. 102

B.C. VICKERY: On retrieval system theory, Butterworth London 1961

Table 2: P. 188 - 189

Casey, Perry, Berry (ed):

Punched Cards, Reinhold Pub. Corp.
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Fig. 10: P. 503

ibid.

Fig. 11: P. 382

ibid.

Distribution: limited

DOCTEC/LEC/5
Tokyo, 15 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

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Toshio Sasaki

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  Series A - Animal Helminthology, 1932
  Series B - Plant Nematology, 1932

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TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

COMPUTERIZED CAS SERVICES

Mr. S. Kimura, JICST

1. Computer Based Publication and Information Service of CAS

Chemical Abstracts Service, along with the entire ACS publications programme, is converting to a computer base. This change in our basic method of handling information will provide powerful new tools for chemists and chemical engineers to meet their information needs.

This does not mean that the ACS is abandoning printed publications. Rather it means that it is shifting from a publishing-abstracting-indexing operation to a computer-based information system from which publications will be derived as one form of output.

Chemical Abstracts (CA) and its indexes will continue, but they will be more timely and more useful. They will be augmented by a computer-based information-retrieval system and by a family of new multipurpose alerting and retrieval tools—services combming current awareness with a deep retrospective searching capability, produced simultaneously in printed and computer-searchable form.

Our goal is a unified system that will produce both a full, printed record of chemical and chemical engineering knowledge and a variety of timely, special-subject alerting services, simultaneously providing a mechanized search and retrieval system that is sufficiently flexible to meet the varied needs of information users. The output will be supplied in whatever form best suits the user's needs--printed pages, microfilm or computer-searchable tapes. Tapes and search programmes will be usable on the customer's computer or CAS will provide custom searches of its own computer files.

2. Uitilization of the Information Contained in Inagnetic Tape (V:Volume, I: Issue)

Indexes

From before

Subject Index (V) (not full use)
Auther Index (V, I)
Molecular Formula Index (V)
Numerical Patent Index (V, I)
List of Periodical (V)

New

Chemical Title (new publication and MT)
Patent Concordance (V, I, and MT)
Keyword Index (I)
Hetero-Atom-In-Context Index :H-A-I-C (V)

Registry System

From before

Ring Index System (publication)
Chemical Compound Registry System

Reference Tool for Bibliography

From before

List of Periodical (C.A. Volume Index)

New

ACCESS (New publication and MT)

3. Computer Readable Data Service

Fig 1 List of MT Service

Service MT	No. of Tourrals (year)	No. of Titles (Issue)	Distribution Frequency	Price/ Year	Started	Remarks
Chemical Titles (CT)	650	5,000 (130,000)	bw (26)	$1,700	1962/Jan	KWIC
Chemical-Biological Activities(CBAC)	600	(20,000)	bw (26)	$1,750	1965/Jan	
Polymer Science & Technology -Journals(POST-J) -Patents(POST-P)	460 -	500 (13,000) 500 (13,000)	bw (26) bw (26)	$1,850 $1,650	1967/Nov 1967/Dec	P & J =$3,400
Basic Journal Abstracts (BJA) CA Condensotes	35 12,000	(15,000) (261,000)	bw (26) w (52)	$4,000 $4,000	1967/Apr 1967/Sept	BJA+CA.Cond =$5,000
Patent Concordance on Magnetic Tape			bw (26)	$500	1962/Jan	1962/Jan-1967/Dec $400/Year.
ACCESS			ANNUAL	$1,560	1969	

Fig. 2 SEARCHABLE DATA ITEM

	CHEMICAL TITLES	CHEMICAL-BIOLOGICAL ACTIVITIES	POLYMER SCIENCE & TECHNOLOGY	BASIC JOURNAL ABSTRACTS	CA CONDENSATES
Words in Title	Yes	Yes	Yes	Yes	Yes
Words in Digest	X	Yes	Yes	Yes	X
Keyword Phrases	X	X	X	X	Yes
Names of Authors	Yes	Yes	Yes	Yes	Yes
Journal CODEN	Yes	Yes	Yes	Yes	Yes
Molecular Formulas	X	Yes	Yes	X	X
Registry Numbers	X	Yes	Yes	X	X

4. Preparation of Search Profiles

4.1 Profile

A search profile is a list of terms which describe the interests of the requestor. The profile sets the specifications under which a search item will be regarded, and hence retrieved, as an answer to the search request.

Ideally, the search profile should be formulated by a person who is both experienced in profile preparation and knowledgeable in the subject matter being searched. Consultation between a person knowledgeable in the subject matter and an information retrieval specialist is a workable alternative.

4.2 Search Term Type

Code	Term Type
A	Authors
C	Coden
M	Molecular Formula
R	CAS Registry Number
T	Title or Digest Words Keyword Phrases

4.3 Molecurar Formulas

Molecular formula terms must be entered on the coding form as follows: Element symbols are entered in alphabetic sequence with the exception of carbon and hydrogen. Carbon is entered first with a 4-digit code (representing the number of atoms in the molecular formula), followed by hydrogens with a 4-digit code, then by all other elements in alphabetic sequence, each of these with a 3-digit code. If, in the molecular formula search term, no carbon is present, the hydrogen will also have a 3-digit code. A 2-digit field is reserved for the element symbols. When one-letter element symbols are used, the second position of the 2-digit field is left blank. Some examples are given below.

Formula	Formula Coded for Search
$C_{22}H_{29}N_7O_5$	C 0022H 0029N 007O 005
C_6Cl_6	C 0006CL006
H_2SO_4	H 002O 004S 001
NaCl	CL001NA001

4.4 Term Truncation Mode

A technique called "term truncation" is used to facilitate retrieval of items containing word fragments which are common to two or more different forms of a word (e.g., between singular and plural forms, or different tenses of a verb). For example, the truncated term *POLYMER* would retrieve the terms POLYMER, POLYMERS, COPOLYMER, POLYMERIZE, POLYMERIZATION, COPOLYMERIZATION, etc. Terms may be searched in any one of four truncation modes.

Search Mode	Symbolic Representation	Explanation
1	*term	Accepts any combination of characters preceding the term.
2	term*	Accepts any combination of characters following the term.
3	term	Accepts term only if bounded by blank spaces or non-alphabetic characters.
4	*term*	Accepts the term with any string of characters either preceding or succeeding the term.

* The asterisk denotes that a blank space or any character may occupy the position so marked.

4.5 Search Logic Term

Logic Term	Symbol	CAS Search
OR	+	0 (same parameter No)
AND	x	(No of parameter)
NOT	-	N

4.6 Search Samples

Reouestor: SAMPLE SEARCH NO. 1

Affiliation:

Address:

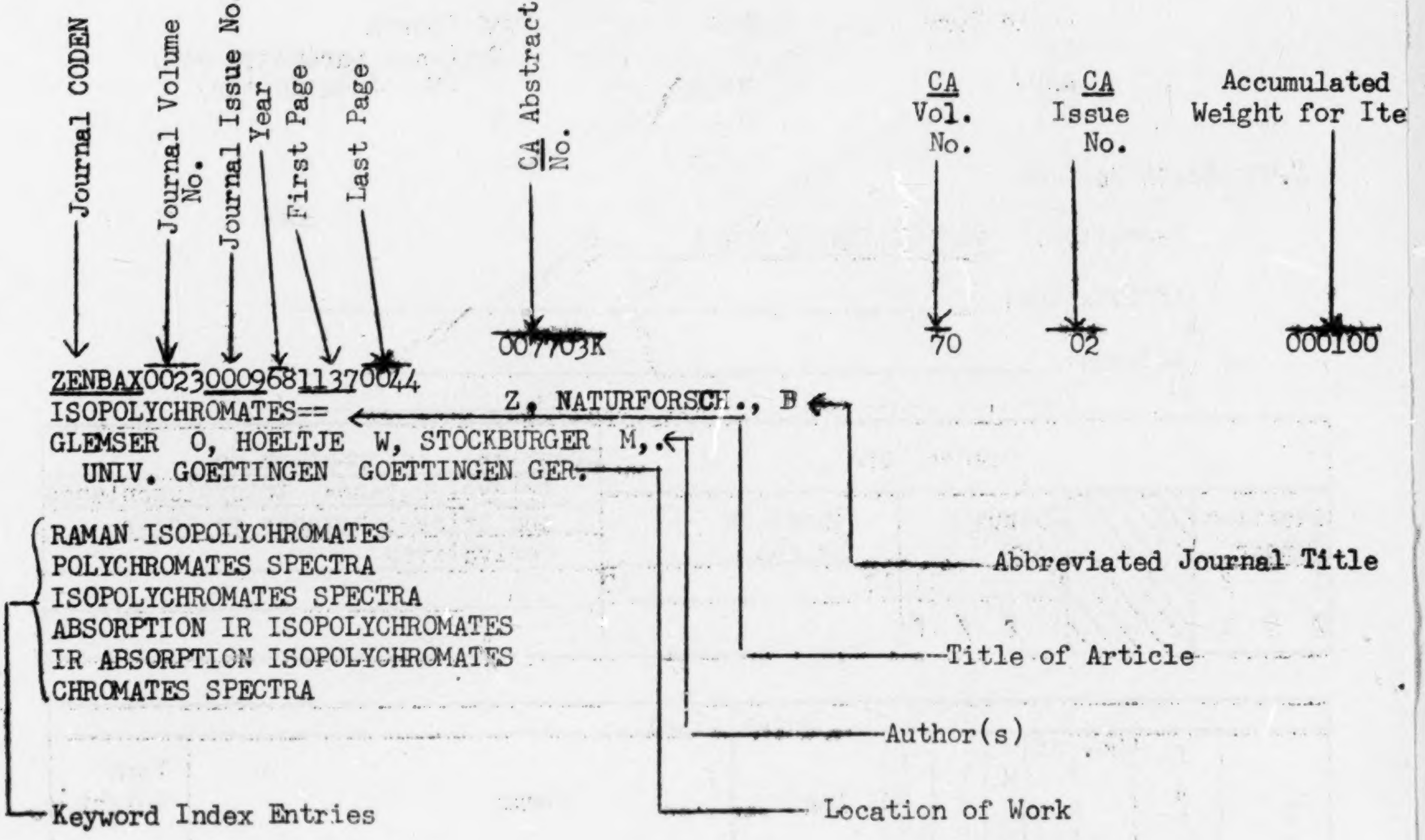
Meader Card				Question: Information on tricyclobutanes, tricyclopentanes and tricyclohexanes or their derivatives
Question Number		Qutput Form	Question Weight	
1 3		8 11	12 17	
0 0 1		1 0 0 0		

Detail Card								
DUPLICATE	PARAM No.	No. of PARAM	MODE	TYPE	LOGIC	Logic	Terms	Term Weight
	4 5	6 7	8	9	10	Do not KP	11 Do Not Keypunch Asterisk 77	78 80
	0 1	0 2	4	T	0		*BUTAN*	
	0 1	DUPLICATE	4	T	0		*PENTAN*	
	0 1		4	T	0		*HEXAN*	
	0 2		4	T	0		*TRICYCLO*	

Sample Search No. 1

This question was coded as a two parameter search (see the Search Profile Form). The search strategy was formulated to retrieve all items containing the term TRICYCLO (Parameter No. 2) and either BUTAN, PENTAN or HEXAN (Parameter No. 1). Truncation Mode 4 was used with all terms in this search. This mode allows for retrieval of the basic tricyclic ring system even though present in the form of its derivatives (e.g., methyltricyclobutane, hydroxytricyclopentane carboxylic acid, and so on).

CA Condensates Programme Evaluation Searches



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                                   007703K                  70       02          000100
ZENBAX002300096811370044
ISOPOLYCHROMATES==                Z, NATURFORSCH., B
GLEMSER  O, HOELTJE  W, STOCKBURGER  M,.
  UNIV. GOETTINGEN  GOETTINGEN GER.

RAMAN ISOPOLYCHROMATES
POLYCHROMATES SPECTRA
ISOPOLYCHROMATES SPECTRA
ABSORPTION IR ISOPOLYCHROMATES
IR ABSORPTION ISOPOLYCHROMATES
CHROMATES SPECTRA
```

Journal CODEN
Journal Volume No.
Journal Issue No.
Year
First Page
Last Page
CA Abstract No.
CA Vol. No.
CA Issue No.
Accumulated Weight for Ite
Abbreviated Journal Title
Title of Article
Author(s)
Location of Work
Keyword Index Entries

FIGURE 3 - SAMPLE OUTPUT - JOURNAL REFERENCE AND KEYWORDS

Sample Profile No. 1

Subject area: Chemical information and information retrieval

General description: It is a general profile aimed at high recall within a broad subject area. Weighting is not used since most terms are representative of the subject area.

Specific capabilities demonstrated:

1) A "two-word" search term
2) Data types T (Text or Title) and C (Coden)
3) Truncation Modes 2 and 3
4) One parameter search with OR logic
5) Abbreviations (SDIç KWIC, and CAS)

Output evaluation:

1) 11 hits
2) 6 relevant (2 are books)
3) Irrelevant hits due to appearance of dissemination and information in different context

CHEMICAL ABSTRACTS SERVICE
SEARCH PROFILE FROM

CA Condensates Programme Evaluation Searches (Old issue)

HEADER CARD				OUESTION: Chemical Information and
Question Number	▨	Output From	Question Weight	Information Retricual
1 5	▨	8 11	12 17	
0 0 1	▨	1 0 0 0		

DETAIL CARD								
	Param No.	No. of Param	Mode	Type	Logic	Logic	Terms	Term Weight
	4 5	6 7	8	9	10	As not KP	11 Do Not Keypunch 77	70 80
Duplicate	0 1	0 1	2	T	0	or	LITERATURE *	
		Duplicate	2	T	0	or	DOCUMENT *	
			2	T	0	or	INFORMAT *	
			2	T	0	or	JOURNAL *	
			2	T	0	or	PERIODICAL *	
			2	T	0	or	TITLE *	
			2	T	0	or	BIBLIO *	
			2	T	0	or	ABSTRACT *	
			2	T	0	or	THESAUR *	
			2	T	0	or	CITATION *	
			3	T	0	or	SDI	
			3	T	0	or	DISSEMINATION	
			2	T	0	or	CURRENT 5 AWARENESS *	
			2	T	0	or	RETRIEVE *	
			2	T	0	or	CONNECTION TABLE *	
			3	T	0	or	CONNECTIVITY	
			2	T	0	or	SUBSTRUCTURE *	
			2	T	0	or	KEYWORD *	
			3	T	0	or	KWIC	
			2	T	0	or	NOTATION *	
			3	T	0	or	NOMENCIATURE	
			3	T	0	or	CAS	
			3	C	0	or	JCHDAN	

```
THRESHOLD WEIGHT--          CHEMICAL INFORMATION & INFORMATION RETRIEVAL

  QUESTION NUMBER 001      DIGEST NUMBER              VOLUME + ISSUE          REFERENCE WEIGHT              PAGE-0001     DATE-69149


                           000073W                    70      01              00000
  ICBEAJCC33CC056EC7330C43
  INC. CHIM. BELGE
  THE PRACTICE OF CHEMICAL DOCUMENTATION.  SELECTION AND APPLICATION OF A MECHANIZED METHOD==
  MASSART C,.
    SOLVAY ET CIE BRUSSELS BELG.
  CHEM DOCUMENTATION METHOD
  DOCUMENTATION CHEM METHOD


                           000074X                    70      01              00000
  ICBEAJCC33CC1C6FC855CC65
  INC. CHIM. BELGE
  A MODERN EXPERIMENT IN CHEMICAL INFORMATION==
  DE PAEPE C, POUPKO JP,.

  COMPUTERS DOCUMENTATION
  INFORMATION DOCUMENTATION CENTER
  DOCUMENTATION INFORMATION CENTER


                           000075Y                    70      01              00000
  ICBEAJCC33CC1C68C866CC78
  INC. CHIM. BELGE
  AUTOMATIC DOCUMENTATION SYSTEM AT EURATOM'S CENTRE D'INFORMATION AND DE DOCUMENTATION==
  DETANT M,.

  INDEXING INPUT DOCUMENTATION
  DOCUMENTATION INPUT INDEXING


                           000076Z                    70      01              00000
  ICBEAJCC33CC1C68C875CC82
  INC. CHIM. BELGE
  SEARCHING LITERATURE FILES BY COMPUTER.  SOME UNITED KINGDOM EXPERIENCES WITH CHEMICAL TITLES AND CHEMICAL-BIOLOGICAL ACTIVITIES
  ==
  KENT AK,.

  COMPUTERS LITERATURE SEARCH
  LITERATURE SEARCH COMPUTERS


                           000083Z                    70      01              00000
  BOOKA7CCCCCCCC68CCCCCCCC
  ENCYCLOPEDIA OF LIBRARY AND INFORMATION SCIENCE, VOL. 1'  A TO ASSOCIAC==
  KENT A, LANCOUR H, EDITORS,.

  LIBRARY SCIENCE BOOK
  INFORMATION SCIENCE BOOK
  BOOK INFORMATION SCIENCE
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FIGURE 5 - SEARCH RESULTS - JOURNAL/PATENT REFERENCE AND KEYWORDS

FILMED FROM BEST AVAILABLE COPY

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THRESHOLD WEIGHT--          CHEMICAL INFORMATION & INFORMATION RETRIEVAL

QUESTION NUMBER 001      DIGEST NUMBER           VOLUME + ISSUE          REFERENCE WEIGHT              PAGE-0002     DATE-69149


                     000332E                     70      01              000000
20JWAS000000006700000000
FAST REACT. PRIMARY PROCESSES CHEM. KINET., PROC. NOBEL SYMP., 5TH
KINETICS OF REACTION CONTROL AND INFORMATION TRANSFER IN ENZYMES AND NUCLEIC ACIDS==
EIGEN M.,
  MAX-PLANCK-INST. PHYSIKAL SCH. CHEM. GOETTINGEN GER.
NUCLEIC ACIDS INFORMATION
CATALYSIS ENZYMES
ENZYMES CATALYSIS
INFORMATION TRANSFER
RELAXATION SPECTROMETRY REVIEW
REVIEW RELAXATION SPECTROMETRY


                     000643G                     70      01              000000
XAERAK000000006700200000
U. S. AT. ENERGY COMM.
INHALATION OF RADIOACTIVE SUBSTANCES.  LITERATURE SURVEY.  II==
GENSICKE F, NITSCHKE MH.,
  STAATLICHE ZENT. STRAHLENSCH. BERLIN E. GER.
INHALATION RADIOISOTOPES
REVIEW RADIOISOTOPE METAB
RADIOISOTOPES INHALATION


                     000579W                     70      01              000000
BOOKA7000000006800000000
TOBACCO-EXPERIMENTAL AND CLINICAL STUDIES.  A COMPREHENSIVE ACCOUNT OF THE WORLD LITERATURE, SUPPL. 1==
LARSON PS, SILVETTE H.,

TOBACCO BOOK
BOOK TOBACCO


                     001537N                     70      01              000000
NETJAN0112002268E10300041
NED. TIJDSCHR. GENEESK.
EXPRESSION OF GENETIC INFORMATION BY THE SYNTHESIS OF A SPECIFIC PROTEIN==
BACHRA BN.,
  RIJKSUNIV. LEIDEN NETH.
GENETIC INFORMATION PROTEINS
PROTEINS GENETIC INFORMATION


                     002680R                     70      01              000000
NATWAY005500106804700003
NATURWISSENSCHAFTEN.
DISSEMINATION OF PESTICIDES==
MAIER BODE H.,
PHARMAKOL. INST. UNIV. BONN BONN GER.
REVIEW PESTICIDES DISSEMINATION
DISSEMINATION PESTICIDES REVIEW
INSECTICIDES DISSEMINATION REVIEW
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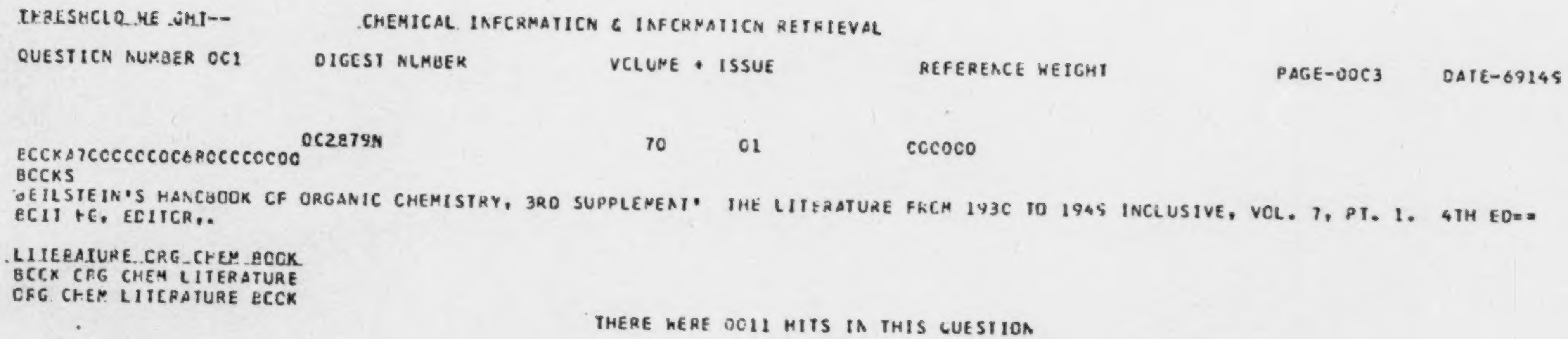
FIGURE 5 - SEARCH RESULTS - JOURNAL/PATENT REFERENCE AND KEYWORDS (cont.)

FILMED FROM BEST AVAILABLE COPY



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IHRESHCLQ_HE .GHI--          .CHEMICAL INFCRMATICN & INFCRMATICN RETRIEVAL

QUESTICN NUMBER OC1     DIGEST NLMBER          VCLUME + ISSUE          REFERENCE WEIGHT               PAGE-OOC3    DATE-69145


                       OC2879N                  70      01             CCCOCO
ECCKA7CCCCCCOC6RCCCCCCOO
BCCKS
BEILSTEIN'S HANCBOOK CF ORGANIC CHEMISTRY, 3RD SUPPLEMENT'  THE LITERATURE FRCM 193C TO 1945 INCLUSIVE, VOL. 7, PT. 1.  4TH ED==
BCIT HG, EDITCR,.

.LITERATURE_CRG_CHEM_BOOK
BCCK CRG CHEM LITERATURE
CRG CHEM LITERATURE BCCK
                                         THERE WERE OO11 HITS IN THIS QUESTION
```

FIGURE 5 - SEARCH RESULTS - JOURNAL/PATENT REFERENCE AND KEYWORDS (cont.)

Distribution: limited

DOCTEC/LEC/7
Tokyo, 29 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

MANUAL SEARCH PRACTICE (Chemical Abstracts)

Yutaka KOBAYASHI
Scientific Liaison Officer, JICST

Masahiko KUROSAWA
Chief of Investigation Section,
JICST

1. Questions

(a) Insect control methods of unpolished and polished rice especially by BHC.

between 1960 - 1968

(b) Ditto

between 1969 - 1970

(c) Insecticidal mechanism of Rotenon

between 1963 - 1966

(d) Distribution of heavy metals in soil and agricultural products

Mercury, cadmium as heavy metals.

between 1968 - 1970

2. Search procedure

2.1. Step 1. Selection of Searching Tool

We suppose to search Question (a) by means of Chemical Abstracts (CA), and must choose appropriate index for this question.

If we search from old times, "6th Collective Index" is considered in the beginning. This index includes from Volume 51 to Volume 55 of CA namely range of 1957 - 1961. It can be expected that references for years of 1960 and 1961 can be obtainable from this index as Volume Numbers of 54, 55 respectively.

Vol.	51,	52,	53,	54,	55,
Year	1957	58	59	60	61

2.2. Step 2. Decision of descriptors

It is distinguished between "unpolished rice" and "polished rice" in this question concerning rice.

We consult the dictionary synonyms for these words, and find "unhulled" or "rough" for "unpolished" and "cleaned" as "polished."

We decide following words as descriptors for the question temporarily.

"unpolished, unhulled, rough rice"

"polished, cleaned rice"

"insecticide"

"BHC"

2.3. Step 3. Settlement of keywords

There are no "unpolished, unhulled, rough, polished, cleaned rice" in the "Subject Index" by consultation. Instead, we found some of them as modifiers under the heading of "rice," so we know heading "rice" is inclusive and available.

On the other hand, heading "BHC" shows "cyclohexane, 1,2,3,4,5,6 - hexachlorocyclohexane" in the "Subject Index" and we are indicated to use "cyclohexane" instead of "BHC."

In this way, we can decide keywords "rice," "insecticide" "cyclohexane."

2.4. Step 4. Consultation of "Subject Index"

We found as follows by "Subject Index" searching.

insecticide (chlorinated) residues on,	53:6461h
insecticide effect on,	54:25529h
insecticide for	51:18449e
CCl_4-1,2-dichloroethane mixt. as, insecticide sorption and insect resistance in relation to	53:11746h
hexachlorocyclohexane as,	*51:6071i; *52:4095b
insect unfestation effect on,	52:596c

Wavelined abstract is applicable for period required.

* These abstracts are suitable for subject, but omitted in this case.

54:25529h, 54 means Vol. 54 (1960)
25529 is number of columns and "h" indicates vertical position within column 25529.

This abstract describes as follows.

Effect on insecticidal seed treatments on rice
L.H. Rolson, Phil Rouse, and Vernon Hall (Arkansas Agr. Expt. Sta., Fayetteville, Ark.). J. Kansas Entmol. Soc. 33, 119-22 (1960)

This describes laboratory tests of dieldrin, Di-syston, heptachlor, Sevin, and toxaphene.

(Omitted partially)

Lindane was sufficiently toxic in the field to have practical implications.

(Omitted)

Greenhouse test shows more efficiency.

(Omitted)

Storage at room temperature for 5 months caused no greater redn. of stand in the treatments than in the controls.

We can understand this abstract is pertaining to the subject and we know "Lindane" is used in the abstract instead of "BHC."

Consulting "Lindane" the "Subject Index for caution's sake we find as follows again.

Lindane, See Cyclohexane, 1,2,3,4,5,6 - hexachloro-

We can understand all synonyms are unified single heading "Cyclohexane."

2.5. Step 5. After 1962 Search

"7th Collective Index" is suitable for this purpose (after 1962).

This index covers Volume 56 - 65 (1962 - 1966) and is divided 13 separate books, but only 9 books are published until now.

These index books cover Aa - Phe as heading words, falling "rice."

We must change the keyword "rice" this time.

We decide to use "insecticide" as keyword for "7th Collective Index" hoping of this word must include all effects and objects applied by insecticides.

There are many headings under "Insecticide"

Insecticide (includes acaricides). (See also Baits; Dipping fluids; Fumigants; Fungicides - Parasiticides; Pesticides; Poisóns; Sprays; Sterilants; etc.)

for rice, benzoic and salicylic acids as,	62:3075g
for rice borers,	65:6228g
for rice crops,	60:8578b
for rice pests, Phostoxin and pybutrin as,	58:13071c
for rice stem borers,	60:2270f, 4713c; 62:16902c
for rice stink bug	58:7311h

65:6228g

Field test of insecticides against rice borers in East Pakistan.

Pakistan J. Sci. 16 (5-6), 259-62 (1964)

This abstract describes Dimecron, diazinon, phosdrin, EPN, endrin, Folithion, Lebaycid, Sevim, Telodrin.

These chemical names are difficult to understand, so consult names in the Subject Index and suitable Chemical Handbooks.

Dimecron. See "dimethyl ester, with 2-chloro-N, N-Diethyl-3-hydroxycrotonamide" under Phosphoric acid.

Diazinon. See "O, O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) ester" under Phosphorothioic acid.

According to these searches, we understand this article treat phosphoric acid mainly.

(We can omitt this article as not pertaining)

60:8578b

Control of Schoenobius incertellas and Chilo suppressalis and Sesamia inferons on the second rice crop in Central and South Taiwan in 1962.

Nung Yeh Yen Chin 12(3) 52-8 (1963)

(not pertaining)

60:8778c

Residual toxicity of some insecticides against the newly hatched larvae of schoenobius incertellas.

Nung Yeh Yen Chiu 12(3) 40-51 (1963)

Soil treatment of 3%BHC (5 g/hill) showed residual control superior to I, II, III and IV.

(So it is decided to pertain)

(The rest is omitted)

2.6. Step 6. After 1966 Searching

There are no "Collective Index" for after 1966 year, but each volumes of CA have Subject Indexes once a volume.

"Volume 66 Subject Index J-Z January-June 1967"

From Vol. 66, serial numbers are given for every abstracts.

"Volume 67 (1968)"

"Volume 68"

"Volume 69 (1969 Jul.-Dec.)"

Subject Index is attached up to this volume.

"Volume 70 (1969 Jul.-Dec.)"

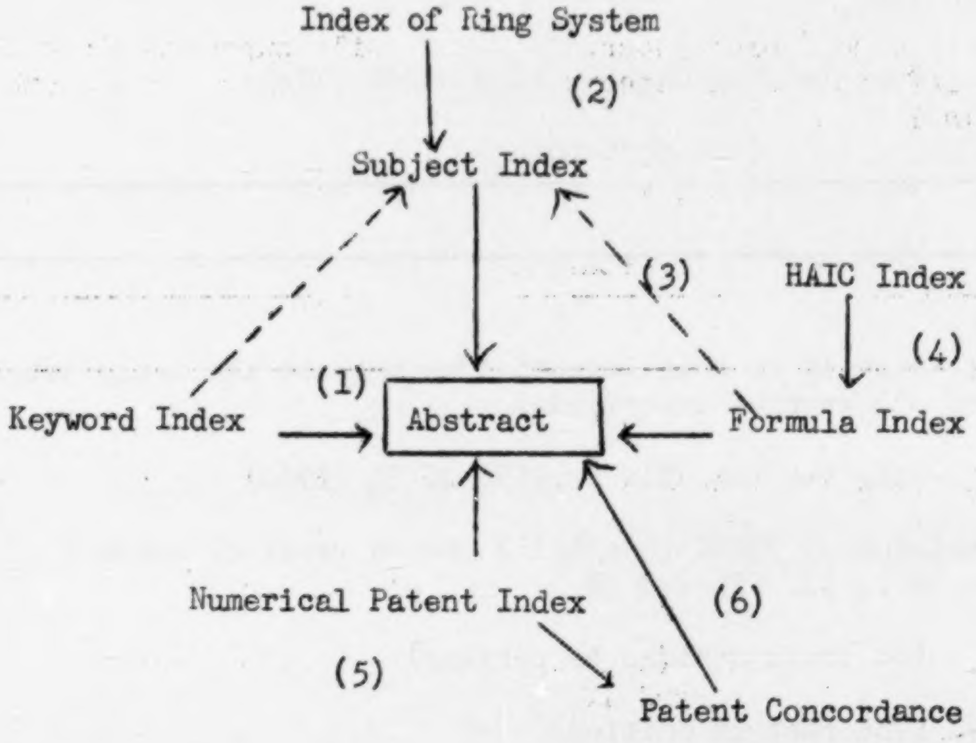
2.7. Step 7. Latest Search

Keyword Index is available.

3. Characteristic of Subject Index of CA

3.1. Depth of Index

CA has deep index, considering the elimination of retrieval falling and familiar usage.


Index of Ring System
(2)
Subject Index
(3)
HAIC Index
(4)
(1)
Keyword Index
Abstract
Formula Index
Numerical Patent Index
(6)
(5)
Patent Concordance

(1) Keyword Index: Interim index for saving the time lag of "Subject Index" in every issue.

(2) Index of Ring System: Connection with the "Subject Index" by means of Cross-reference and scope note.

(3) Formula Index: Connection with the "Subject Index" by means of cross-reference in the case of special compounds and their derivatives.

(4) HAIC Index: Supplement of "Formula Index"

(5) Numerical Patent Index - Patent Concordance: Between Basic patent - corresponding patents which are applied other countries

(6) Able to know basic patent number

3.2. Unification of synonimous words.

This eliminate the confusion and anxiety on synonimous words.

3.3. Systematic search system

It is very efficient to search by means of main concept and subordinate concept relation in CA system.

Distribution: limited

DOCTEC/LEC/8
Tokyo, 29 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

SEARCHING ACTIVITY OF THE INVESTIGATION SECTION OF JICST

Masahiko Kurosawa
Investigation Section,
Service Division, JICST

1. Searching system and request form
(Fig. 1, 2)

2. Present status

We are receiving requests only on scientific and technical information. We search CA 100 questions a month, and 80 continuous (watching) searches every month at present. Roughly 60% of normal searches are patent search and 40% are literature search.

Fiscal Year	Number of Request	Direct Request Quotation	Number of Answer
1966	1019	514 505	741
1967	1108	646 462	830
1968	1416	954 462	1125
1969	1490	918 572	1193

(Table 1)

Fig. 1

Questions Answering Service System (1970. 7. 29)

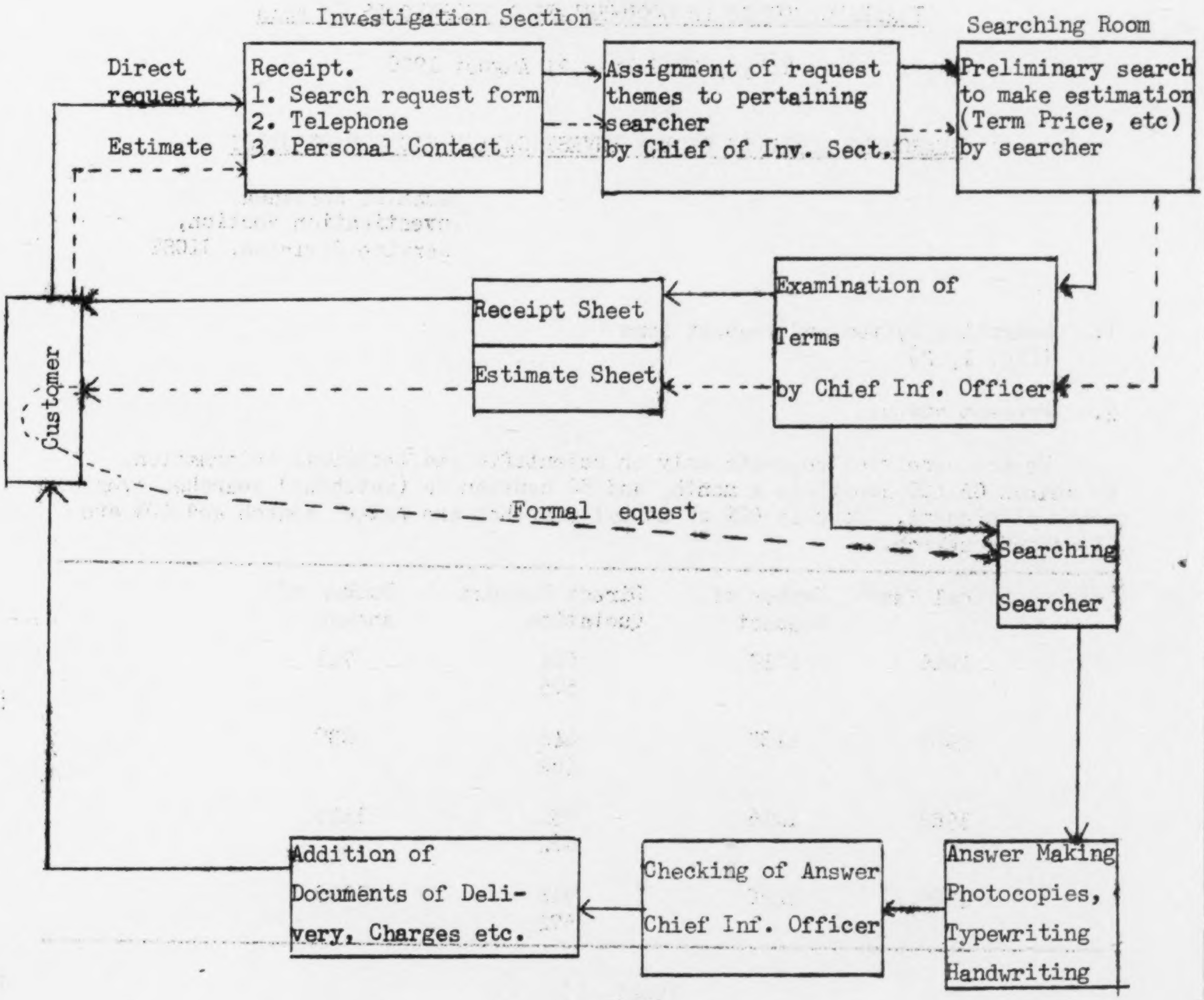

Investigation Section
Searching Room
Direct request
Estimate
Receipt.
1. Search request form
2. Telephone
3. Personal Contact
Assignment of request themes to pertaining searcher by Chief of Inv. Sect.
Preliminary search to make estimation (Term Price, etc) by searcher
Customer
Receipt Sheet
Estimate Sheet
Examination of Terms by Chief Inf. Officer
Formal equest
Searching
Searcher
Answer Making
Photocopies,
Typewriting
Handwriting
Checking of Answer
Chief Inf. Officer
Addition of Documents of Delivery, Charges etc.

Fig. 2

REQUEST FORM

1. Subject (Describe in datail and give the most important point)

2. Purpose of the search (Check article(s))

   For the reference to the research

   For the patent application

   For the motion of the opposition to the patent publication

3. Reference if you have (to indicate the interest clearly. Bibliographical entry or photocopies.)

4. Direct request or quotation (See remarks (2))

5. Scope and periods (Check articles(s) and describe the periods)

Japanese literature *	19	-	19	***
Foreign literature **	19	-	19	
Japanese patent	19	-	19	****
Japanese utility models	19	-	19	*****

6. Form of answer (Check article(s))

   Photocopy of original

   Photocopy of Japanese patent (utility model) specification

   Photocopy of abstracts (in Japanese)

   Title list (in English)

   English abstracts

Remarks

* Usually we search (A) "Current Bibliography on Science and Technology" (abstracts journals divided 9 series according to the categories of science, published by our JICST). They include the Japanese literatures since 1966, so we use (B) "Japanese Periodicals Index" (index journal published by the National Diet Library) for before 1966.

** We search the above (A), and "Chemical Abstracts", "Engineering Index", "Electrical and Electronics Abstracts", etc.

*** Usually 10 years (Coverage of above (A))

**** Usually 15 years (before date of application. Period of validity)

***** Usually 10 years (before date of application)

(1) Search fee (in general):

$10.00/year ($5.00/hr. searcher)

(2) Price of answer(s):

Photocopy of original or patent	ca $1.50/1 article
Photocopy of Japanese (or Foreign) abstracts	$0.50/1 article
Title list: translation fee	$1.50/100 Japanese letter

English translation: a) literature: author (in roman letter), title, name of journal, volume, number, date, page. b) patent and utility model; publication number, date, title, name of patentee, priority matter.
If you want the English abstract, an abstract contains ca 300 Japanese letters.

Typewriting fee	$1.00/sheet

about 6 articles in a sheet

(3) It is requested that the prepayment of the fee to our JICST as per the international rules is made.

We will inform you the total price when we finish the search. The charge for search varies according to the amount of work actually entailed in each case. An estimate of the charge may be obtained from the JICST free of obligation before the search is undertaken or, in order to avoid delay, the request for a special search may adopt one of the following procedures.

a) Agree in advance to whatever charge will be made.

b) Indicate a maximum amount which the charge for the complete search may not exceed, in which case an estimate is only made if the JICST considers that the maximum amount indicated will probably be insufficient.

c) Indicate a maximum amount up to which the JICST is authorized to conduct the search. If this amount is reached before completion of the search, the requester is notified of the results and provided with an estimate for completion of the search.

(4) Report delivery time

The report is normally mailed within a several weeks of receipt of the search request by the JICST.

Phone: 581-6411
Cable: JICSTECH TOKYO

THE JAPAN INFORMATION CENTER
OF SCIENCE AND TECHNOLOGY

1-1 2-chome, Nagatacho, Chiyoda-ku, Tokyo
C. P. O. Box 1478, Tokyo, Japan

Your ref.:
Our ref.:

Dear Sirs:

Thank you for your letter of search request to our JICST.
We made a brief request form as the demand of the information search from abroad has recently been increasing remarkably, and usually missing some conditions necessary for the searching practice and for price estimation. We would like to ask you to instruct us the search scope exactly according to the request format enclosed here.

Looking forward to hearing from you, we are.

very truly yours,

Masahiko Kurosawa
Chief of Investigation Section
Service Division

MK:km

1968 (Restropective search)

	Number	%	Amount of Money	%
Literatures	488	43	9,763,211	36
Patents	578	52	17,393,551	63
Others	59	5	353,020	1
Total	1,125		27,509,782	

(Table 2)

Patent Search (1968)

Country	Number	%	¥	%
Japan (Patent, Utility Model)	275	47	6,483,404	38
U.S.A.	166	29	5,750,132	34
Great Britain	46	8	1,459,396	9
Germany (West)	39	7	1,213,491	7
France	18	3	539,750	3
Others	38	6	1,688,145	9

(Table 3)

Purposes of Patent Search are

(1) Applicant (or inventor) search: for patent application or alerting
(2) Corresponding patent search: for patent application or exportation of technique
(3) Pertaining patent search: for research, seek for new technique and this search is most general
(4) Novelty search: patent application
(5) Objection for another patents (This is most difficult search)

Purposes of literature are

(1) Get new technique or idea
(2) To establish research project
and
(3) For the patent concerning

Searcher

We have 13 information officer and 5 technical non regular members (Searching Room)

	Chemistry	Mechanics	Electricity	Metal
Information Officer	5	3	3	2
Technical non regular members	1	2	1	1
Total	6	5	4	3

(Table 4)

In Investigation Section

	Clerk	Typist
Regular	3*	1
Part-time	3	2

* One person is information offices

Searching tool

There are 120 foreign and 45 domestic abstracts and index books in Searching Room. We have many patent journals and gazettes for patent search and directories for reference.

3. Actual condition

One search is usually done as follows

Preliminary search: Confirmation of subject requested. Decision of classification or descriptor to be searched.

Practical search: Modification of search schedule is needed in some case. Draft of answer is made, and delivered to the person in charge of answer arrangement. (typist, copier etc.)

Checking of Answer form

Recently, search requests are turning out very severe and difficult, so searching time is becoming longer. We used to accept a search more than 1 month later as the deliver time because we must schedule waiting time.

Searching period (year) is 5-10 years in literature search. New idea or technique must be developed recently but research work would be occured beforehand.

In patent search, searching period is much longer, time of validity of patent is requested usually, (15 years in Japanese patent, 10 years Japanese utility models and 17 years in US Patent and so on).

Tendency of Search is showed in Figure 2, 3, 4

Themes are distributed Agriculture, food, biochemistry, to physics, management, forecasting of technique.

Air pollution, Exhaust gas from automobile engine, and absorption of toxic substances in the foods or plant are very serious problems in Japan, and search requests increasing remarkably.

For materials, many subjects concerning composite materials, whisker, and structural disign are requested.

4. Some points of search

Training of searcher

Searching work is very exhaustive and require interdiciplinary knowledges in many cases.

Needless to say, the librarianship is very important to complete search and we educate the engineer for this purpose. They learn about (a) The use of abstracts and reviews. (b) The use of non-journal literature, e.g. government publications, patents, etc. (c) Main literature sources in his major field. (d) The use of computor-produced indexes such as CT, POST, CBAC, COMPENDEX, etc. (e) Photoreproduction including micromation.

There are distinct problems for the searcher.

(1) Keeping up with a particular line of research or interest.

(2) A new line of research - often a method of technique.

(3) Old information.

(4) Movement of Patent Systems in the world.

Search manual

We made search manuals of patents last year, e.g. US patent, G.B. patent, West Germany patent and Japanese patent and utility model, because search schedules for these countries were quite different in detail, and the searcher's experiences on patent searches were thought quite valuable.

Bookmark

We write the abstracts (or patent) number or bibliographies down in a format paper in the search practice. Sometimes we must identify same numbers or same bibliographies from the different descriptors (Keywords) and cansel the same citations to limit the noises retrieved.

This treatment is troublesome unexpectedly.

So, some searchers using small cards for this identification. They write down abstract numbers into small papers, and arrange papers in numerical order, so they can unify the same number easily.

All searchers using bookmarks for indication of their search.

We give the reference numbers for every questions like QA 45-123 (45 means number of the name of a chronological era, 123 is sequential number).

Let's assume some seracher use Chemical Abstracts for his search, and he extracts 100 abstracts pertaining subject, he write in 100 blue papers, like QA45-123, 51:23456h and insert them as bookmarks. Clear typewriting or photo-duplications are made by these bookmarks.

If some other searcher want to indicate in same Chemical Abrstracts Volume, he may choose reddish paper instead of blue. There are several colored papers. (red, blue, yellow, violet, brown, etc.)

5. Advantages of request search (instead of in house search)

Numerous reasons are cited for undertaking request search.

The most frequent ones cited by those in industries who undertake request search indicate that outside facilities are as follows.

(a) obtain the diverse talents in one organization with a broad background

(b) provide technological skills that would be uneconomic for a firms to acquire permanently

(c) give flexibility to increase or decrease search programs without undue capital investment in internal search facilities

(d) stimulate the thinking and creative effort of an organization's own search staff

(e) provide a measure of efficiency of internal search

Distribution: limited

DOCTEC/LEC/9
Tokyo, 29 July 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

CHEMICAL ABSTRACTS, CHEMICAL TITLES, AND CBAC

Kobayashi, JICST

1. Chemical information in relation to life sciences

In principle, and also historically, some branches of chemistry originated in life sciences (botany, zoology, and medicine). And the knowledge in life sciences nowrished chemistry, and vice versa, new findings and theories of chemistry contributed to the advancement of life sciences.

Actually, by the aid of Chemical Abstracts a considerable portion of life science literature can be made accessible for both chemists and life scientists.

2. The Chemical Abstracts is prepared and published by the Chemical Abstracts Service (CAS) of the American Chemical Society, together with other companion publications.

It began publication in 1907, and various minor changes, with a few fairly far-reaching improvements, have been made throughout its history extending over 60 years.

It goes without saying that the advent of electronic data processing system had given the most drastic effect to CAS, particularly in 1960's

3. As shown in Fig. 2 and 3, CA is the largest data bank in the world and also concerns with more than 50% of all scientific research in many respects.

Its recent statistics read: (as of 1966)

Abstracts prepared: 216,746
Total abstracts (1907-66): 3,619,152
Budget (1967 estimate): $12.5 million
Source documents: 12,000
Journal productivity (1962-66):

Top 50 journals	26% abstracts
100	36
500	63
1,000	74
5,000	95

Fig. 1

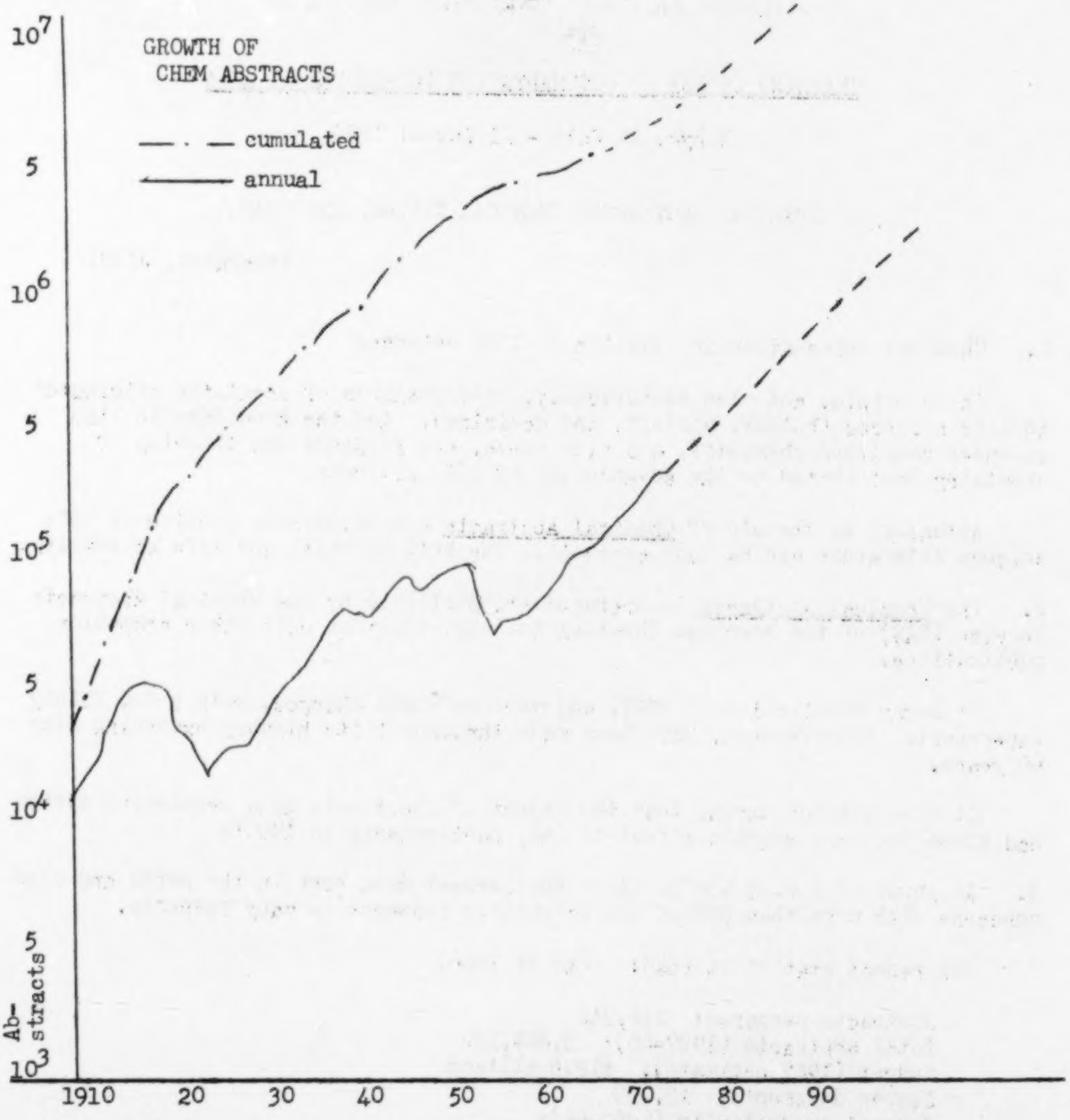
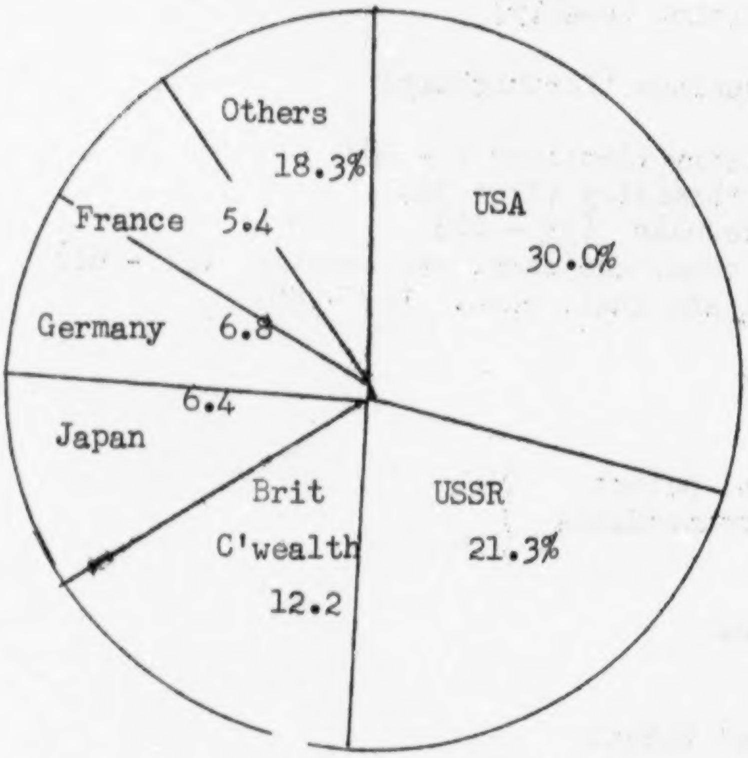

GROWTH OF
CHEM ABSTRACTS
cumulated
annual
10^7
5
10^6
5
10^5
5
10^4
5
10^3
Ab-stracts
1910
20
30
40
50
60
70
80
90
1907
Year

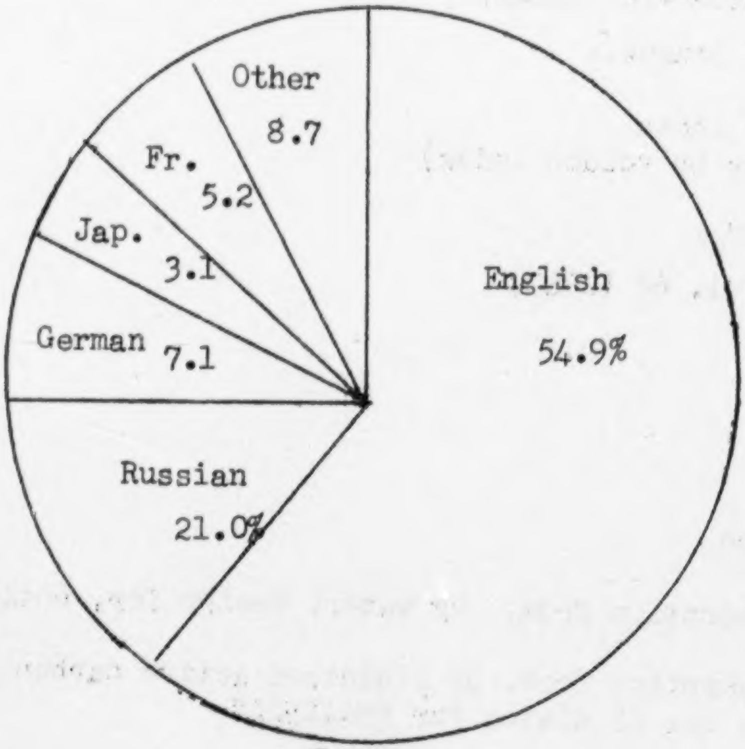
Fig. 2

CA in 1966

National Origin



Language



4. Structure of CA

1907—, 2 volumes/yr.

- Complete edition (weekly)
- Section Groupings (fortnightly)

    Biochemistry (Sections 1 - 20)
    Organic chemistry (21 - 34)
    Macromolecular (35 - 46)
    Applied chem. and chem. engineering (47 - 64)
    Physical and anal. chem. (65 - 80)

- Issue index

    Keyword
    Numerical patent)
    Patent concordance)
    Author)

- Volume index

    Subject
    Numerical patent)
    Patent concordance)
    Author)

    Formula)
    Ring system)
    Hetero-Atom-in Context)

    List of journals

- Collective index
  (same as in volume index)

5. CA Subject index

(example) Vol. 66 (1967)

Air

See also

Aeration
Atmosphere

acetone absorption from, by water, design for, 66:47812U

acetone adsorption from, by fluidized active carbon in perforated -- plate column, no. of plates for 66:12524Z

aerosol and gaseous forms of (2, 4 - dichloro - phenoxy)
and (2, 4, 5 - trichlorophenoxy) - acetic acid esters in,
66:49019Q

anal. of -- see Air, analysis
bubbles of -- see Bubbles
in combustion -- see Combustion cooling by, in ammonia manuf.,
66:12207Y

expired or respiratory -- see also Animal respiration

expired or respiratory, acetone in, after medium-chain triglyceride
ingestion, 66:754K

benzene in, as exposure indicator, 66:88440q

carbon dioxide in, in fat utilization test, 66:44884H

Air, analysis
Air, conditioning or purification of
Air, pollution of
Air bladder

6. Recent improvements by CAS

1961 Chemical Titles (CT)

1963 CA section groupings

1965 Chemical-Biological Activities (CBAC)

1965 CT tape edition   CA microfilm edition

1967 Polymer Science and Technology (POST-J and POST-P)

1967 Basic Journal Abstracts (tape only)

1969 CA Condensate (tape only)

(Chemical Compound Registry Structure Search System)

7. Chemical Titles

1961 --, fortnightly (also in tape form)

Purpose: current-awareness
Coverage: ca. 650 journals; 114,000 citations
Method: Keyword-In-Context System
Overall structure:
- a) KWIC index
- b) Bibliography
- c) Author index
  (without cumulation)

Time lag*): min. -2 weeks average 7.0 max. 15

---

*) According to M.A. SIMKIN

8. Chemical - Biological Activities (CBAC)

1965 -, fortnightly, 2 volumes/yr. (also in tape form)

Purpose: Alerting and retrospective search

Coverage: ca. 600 journals; 18,000 abstracts (1968)

Method: Digest, searchable against keywords in title and in digest

Overall structure:

Digest, arranged by journal title
KWIC index)
Morecular formula)
Registry number) cummulated for a volume
Author)

Time lag*): min. 2 weeks average 14.5 max. 35

---

*) According to M.A. SIMKINS

9. Problems encountered in alerting services

a) Uncontrolled vocabulary in title index

Table 1. Indexing terms from Chemical Abstracts, Vol. 66, irrecoverable from a title index

	Keyword group category	Percent irrecoverable from a title index **)
(i)	Substances	34
(ii)	Processes (incl. apparatus and equipment)	12
(iii)	Biological systems, conditions, and activities	6
(iv)	Properties (and their measurement)	19
(v)	Theoretical aspects*	(6)
(vi)	Miscellaneous*	(19)
	Overall average	23

* Less than 5% of sample. Figures in parentheses are not statistically reliable

** SIMKINS, M.A., Retrieval of Information from the Recent Literature of Medicinal Chemistry, Chemistry and Industry, (No. 5): 146-150 (1968) (cited by R.T. Bottle).

Table 2. Numbers of papers listed in the 1963-64 subject indexes of BA and CA under Hevea and Rubber*

	Hevea only	Rubber only	Both
BA	28	38	4
CA	16	15	2

* Bottle, R.T., Retrieval of Information by the User, Institute of Biology Journal, 14 (No. 1): 3-4 (1967).

b) Delay time

Table 3. Time intervals in weeks between receipt of primary and secondary references for a library in Britain*)

Secondary journal	British journals (t)			n	American journals t			n
	min.	av.	max.					
CT	2	6.5	9	23	-2	3.5	7	31
CBAC	10	14.9	21	14	2	8.0	12	16
CA	8	12.5	21	24	2	6.4	12	32
Total papers				24				32

n: number of papers on medicinal chemistry in the group

*) SIMKINS

Source: Bottle, R.T., Title Indexes as Alerting Services in the Chemical and Life Sciences, J. Amer. Soc. Info. Sci., 21 (No. 1); 16-21 (1970).

Distribution: limited

DOCTEC/LEC/10
Tokyo, 10 August 1970
Original: Japanese

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

COPYING IN DOCUMENTATION

by Taizo Amano
Tokyo Shibaura Electric Co., Ltd.

1. Basic concept of MIS (management information system) and its problems

In the present age of mass communication and information, businesses have been trying one way and another to establish their management information system, although the basic concept of MIS and what it actually is have not yet been expounded in definite terms.

The goal of MIS, I believe, can be achieved step by step through studying what kind of information is needed by the mangement or industry, and what method should be employed to furnish the information required for decision making to the people who need it when it is needed. From this you will see how important a role reprography can play in this field, too.

2. Importance of copying

A number of companies seem to be achieving steady results in improving their copying and printing systems in view of the increasing need for the rationalization of office work. As a way of realizing management rationalization, statistical accounting machines, electronic computers, single-purpose accounting machines and various kinds of calculators have been employed extensively. The use of these machines and devices has helped to achieve a significant degree of rationalization, so that there is a big difference between what it was ten and some years ago and now.

On the other hand, there are still many companies where copying and printing, particularly the simple kind, are done as part of the work of their general affairs section or by girl employees because they can be handled by any one after some training. Writing, typing, copying and printing occupy a large portion of what is generally called office work. In certain firms, as you probably know, these kinds of work far outweighs calculating work both in quantity and quality.

What deserves special mention in connection with the foregoing statement is the advent of the diazo process copying machine. When one looks back upon the history of the mechanization of management, he is apt to pay attention only to the process starting with the use of the accounting machine and leading to the punch card system and then to the electronic data processing system. It must be remembered that the diazo process copying machine, which made its debut some time after World War II, has made its way into all segments of industry like a wild fire spreading fast over the entire field. It was a revolutionary device. Most of the office machines that we see today made their appearance about the same time. The contribution of the diazo process copying machine to the improvement of office work cannot be overemphasized. We should never overlook this fact, although today the diazo process looks like being replaced by the static process counterpart.

3. Combination of copying and printing

The advent of the copying machine was an epoch-making event that deserves special mention in the mechanization of management in the postwar years. During the ten and some years since its debut, the copying machine had played an ever important role, but the increasing demand for a combination of copying and printing processes must be taken into account.

Now, let me explain to you about the functions of copying:

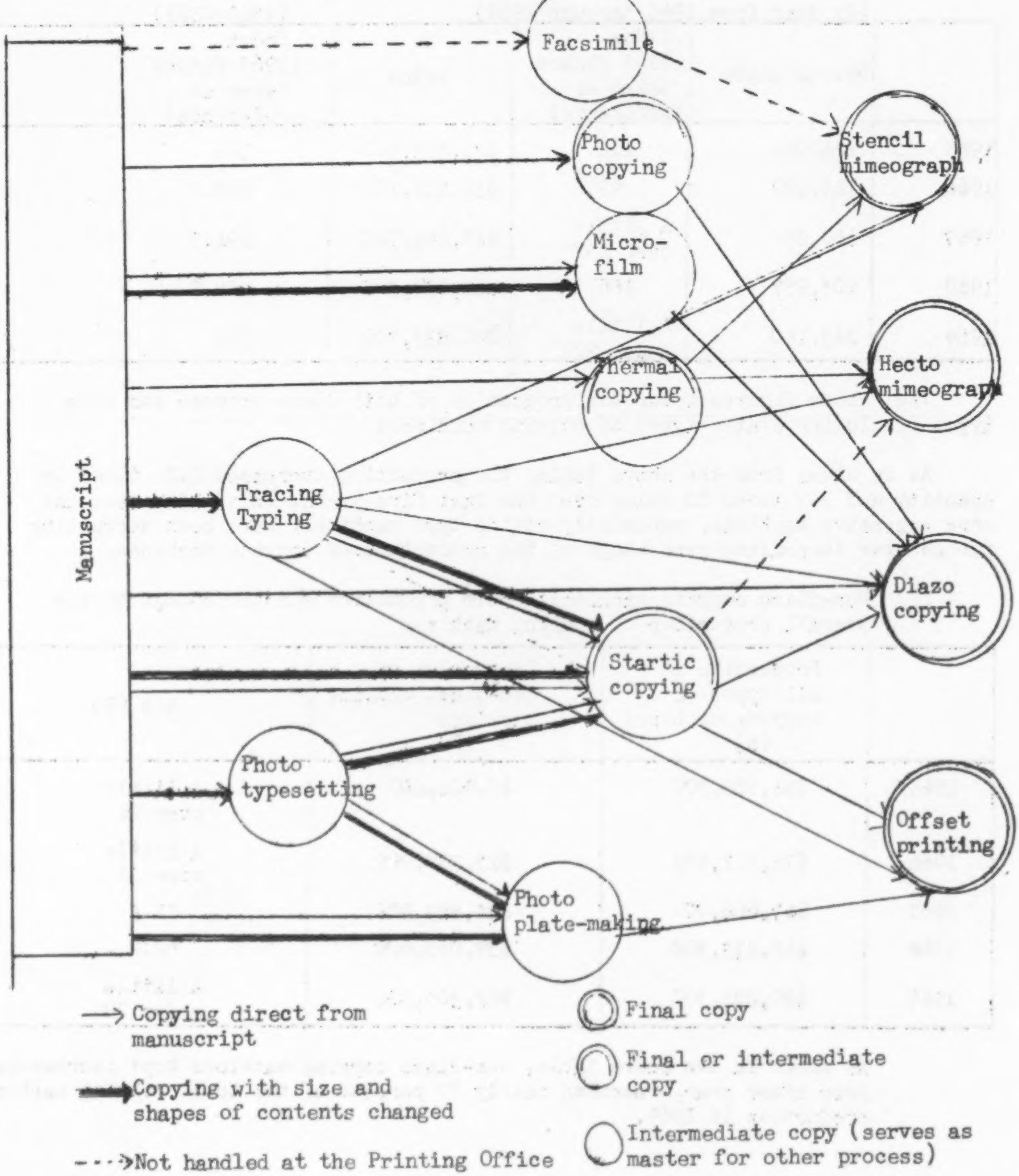
(1) Intermediate copy (Master for printing).

(2) Final or intermediate copy.

(3) Final copy.

These three kinds of copies are illustrated in the following diagram as to their relationships with the copying and printing processes.

Combination of copying & printing: Preparing masters


Manuscript
Facsimile
Photo copying
Micro-film
Thermal copying
Tracing Typing
Photo typesetting
Startic copying
Photo plate-making
Stencil mimeograph
Hecto mimeograph
Diazo copying
Offset printing
Copying direct from manuscript
Copying with size and shapes of contents changed
Not handled at the Printing Office
Final copy
Final or intermediate copy
Intermediate copy (serves as master for other process)

4. Production of copying machines

(1) Production of copying machines in terms of quantity and value (By year from 1965 through 1969) (¥360=US$1)

	No. of units	Index (1965 figure taken as reference)	Value	Index (1965 figure taken as reference)
1965	124,044	100	$24,583,300	100
1966	114,499	93	$31,611,100	128.7
1967	160,280	A little over 137	$47,666,700	194.3
1968	205,987	166	$62,833,300	256.8
1969	283,140	A little under 222	$90,833,300	370

The above figures cover the production of both diazo process and other types (including static type) of copying machines.

As is clear from the above table, the production increased 2.2 times in quantity and 3.7 times in value over the past five years. This indicates that more expensive machines, especially static type machines, have been accounting for an ever increasing percentage of the production of copying machines.

(2) Non-diazo copying machines: their production and percentage to the overall production of copying machines

	Production of all types of copying machines (A)	Production of non-diazo copying machines (B)	B/A (%)
1965	$24,583,300	$5,944,400	A little over 24
1966	$31,611,100	$13,388,900	A little over 42
1967	$47,666,700	$24,583,300	51.5
1968	$62,833,300	$39,055,600	62.0
1969	$90,833,300	$62.305,600	A little under 70

As shown in the above table, non-diazo copying machines kept increasing year after year, reaching nearly 70 percent of the total copying machine production in 1969.

5. Kinds and functions of copying machines

(1) Diazo copying machines

These machines use a sensitized paper coated with diazo compounds and a light source.

a. Semimoist process diazo copying machine

This kind of diazo copying machine uses a liquid for developing.

b. Ammonia process diazo copying machine

This type uses ammonia vapor or heat for developing

c. Major makes

i. Moist type

Make	Size (mm)	Copy width (mm)	Separating master	Light source	Copying speed	Price
Richo						
Ricopy 680	955x440x323	680	Automatic	Mercury lamp 1.25kw	0 - 6m per min.	¥255,000
Ricopy Separate	760x570x350	480	"	800W	0.3-6.6	¥167,000
Ricopy Standard	750x470x200	480	Manual	800W	0.3-6.7 per min.	¥122,000
Ricopy Hi-Start I	0x270x200	450	"	Fluorescent lamp 60W	0.25-3.3 per min.	¥45,000
Ricopy Hi-Start II	738x435x250	450	"	" 80W x 2	0.3-5 per min.	¥98,000
Ricopy Hi-Start 4	738x458x275	450	Automatic	" 80W x 4	0.5-10.8 per min.	¥142,000
Copyer						
Flash	730x236x210	460	Manual	" 90W	30-170m per hr.	¥48,000
Flash 2 Separate	739x389x285	460	Automatic	Fluorescent lamp 85W x 2	30-350m per hr.	¥99,800
Flash 3	730x580x300	460	Manual	" 60W x 3	20-300m per hr.	¥89,000

Make	Size (mm)	Copy width (mm)	Separating master	Light source	Copying speed	Price
Flash 4 Auto	760x872x387	475	Automatic	Fluorescent lamp 800W x4	30-650m per hr.	¥195,000
Flash 4 Separate	760x580x386	475	"	"	30-650m per hr.	¥165,000
Elite 800	760x580x800	460	Manual	Mercury lamp 800W	30-400m per hr.	¥148,000
Elite 1200	940x650x310	640	"	" 1200W	30-400 per hr.	¥228,000
Roland 1000 Auto	760x877x330	460	"	" 1kw	30-650 per hr.	¥209,000
Roland 1000 Separate	760x610x330	460	"	" 1kw	30-650 per hr.	¥179,000
Mita Kogyo						
Satto 150	600x170x160	450	"	Fluorescent lamp 90W	30-210m per hr.	¥48,500
Copyster Dash 2A	660x293x211	450	Manual	" 90W x 2	30-400m per hr.	¥85,000
Dash 3B	680x380x270	450	Automatic	" 90W x 3	30-300m per hr.	¥118,000
Super Dash 4A	680x380x320	450	"	" 90W x 4	30-515m per hr.	¥138,000
Super Dash 6A	680x420x820	450	"	" 90W x 6	30-375m per hr.	¥195,000
Hit 800	744x827x336	475	Manual	Mercury lamp 800W	30-425m per hr.	¥145,000

Make	Size (mm)	Copy width (mm)	Separating master	Light source	Copying speed	Price
Dart	810x610x278	480	Manual	Mercury lamp 800W	30-470m per hr.	¥161,000
Auto Separate Hit AS	744x630x336	475	Automatic	Mercury lamp 800W	30-450m per hr.	¥188,000
800 Separate	700x420x880	475	"	"	30-475m per hr.	¥185,000
1200 Separate	897x510x901	676	"	" 1200W	30-375m per hr.	¥268,000

ii. Dry type

Make	Size (mm)	Copy width (mm)	Separating master	Light source	Copying speed	Price
Ricoh						
SL-2	1470x1140x500	1100	Manual	Mercury lamp 1800	0.4-5m per min.	¥600,000
OM-2	790x1190x740	480	Automatic	" 1500W	0.4-14m per min.	¥740,000
AC-1	1280x930x570	900	Manual	" 1400W	0.3-5.8m per min.	¥430,000
Auto F	780x1120x1320	480	Automatic	" 1500W	0.6-14m per min.	¥1,300,000
PM-770	1747x1225x1605	1100	"	" 5000W	19m per min.	¥3,400,000
PL-3	1770x1100x1550	1100	"	3500W	0.4-8.3m per min.	¥1,650,000
PL-4	1770x1100x1550	1100	"	5000W	0.4-8.3m per min.	¥1,980,000
PL-5000	1850x1850x1250	1200	"	" 5000W	0.8-20m per min.	¥4,100,000

Make	Size (mm)	Copy width (mm)	Separating master	Light source	Copying speed	Price
Copyer						
Business Deluxe	950x806x480	650	Manual	Mercury lamp 1200W	20-300m per hr.	¥278,000
Spurt Auto	822x1121x780	450	Automatic	" 1800W	30-750m per hr.	¥680,000
Spurt II	822x1121x780	450	"	"	30-750m per hr.	¥495,000
Mighty	1375x955x610	950	Manual	2100W	20-400m per hr.	¥487,000
R-46 Crux	1795x1150x1575	1100	Automatic	" 3.6-4.8kw	30-500m per hr.	¥1,700,000
Ita Kogyo						
Victory	850x1105x1265	475	Manual	1500W	30-850m per hr.	¥750,000
Gold G	780x900x650	440	"	1500W	30-500m per hr.	¥558,000
Eriga	1370x870x850	950	"	1500W	15-350m per hr.	¥523,000
Dina S	1510x1225x810	950	"	1700W	400m per hr.	¥670,000
Dina 3000	1510x1225x810	950	"	3000W	700m per hr.	¥780,000
Dina Wide	1740x1225x810	1130	"	3000W	550m per hr.	¥880,000
Great	1722x1282x1587	1200	Automatic	3000W	500m per hr.	¥1,650,000
Gloria II	1820x1310x1660	1200	"	4500W	700m per hr.	¥1,980,000
Dyna-Miracle 3000	1510x1225x810	950	Manual	3000W	700m per hr.	¥1,300,000

In addition to the above-mentioned makes, the following are available on the market.

1. Azona printer from Yamamoto Shokai, Ltd.
2. Copynica from Bunshodo, Ltd.
3. Jim Copy from Jimuki Kogyo, Ltd.
4. Diado Copy from Sakurai Kogyo, Ltd.
5. Minolta Copypet from Minolta Camera Co., Ltd.

(2) Photo-copying machines

This type uses a sensitized paper coated with a silver emulsion and a light source which provides penetrating or reflected rays of light.

i. Diffusion transfer reversal process copying machine

This type of copying machine involves the use of a negative sensitized paper, which is subjected to exposure to reflected rays of light, and a positive to which a positive image is transferred.

ii. Major makes

Make or distributor	Classification by type of operation	Size (mm)	Copy width	Copyable object	Light source	Price
Azona Kanko-shi KK	Diffusion transfer reversal	1450x1200x800	Max. A0	No limit	Incandescent lamp x 34	¥350,000
Ilphont Processor 1501 (UK)	Stabilize	760x270x170	365mm (14")	Negative film	100W	¥110,000
Processor 2001	"	890x270x170	457mm (18")	"	100W	¥168,000
A.B.Dick Photocopyer 104 (US)	Diffusion transfer reversal	565x297x121	229	Sheet	Special fluorescent lamp	¥49,500
A.B.Dick Photocopyer 120	"	648x267x254	B4	Sheet, book; 254 x 394mm	Incandescent lamp	¥83,000

Make or distributor	Classification by type of operation	Size (mm)	Copy width	Copyable object	Light source	Price
Fuji Film Quickcopy system Printer S	Stabilize	420x590x240	297x420 mm; A3	Sheet, book	Special small bulb 100V 20W	¥43,000
Processor II	Combined with printer S	630x240x130	"		13W	¥38,000
Combi	Stabilize	670x300x100	297x420 mm	Sheet	Special fluorescent lamp 15W	¥60,000
Contact Printer II	Stabilize	470x280x210	203x254 mm	"	Special small bulb 20W	¥35,000
Industrial Processor	"	630x240x130	297x420 mm	"	13W	¥48,000
Tracer A1	"	1190x310x340	594x841 mm	Sheet	"	¥215,000
Tracer A2	"	1080x310x340	420x594 mm	"	"	¥128,000
Eastman Kodak: Kusuda Jimuki	Diffusion transfer reversal	500x570x250	210x350 mm	"	Fluorescent lamp 100W	¥120,000
Ready-Print: Sumitomo 3M 3M-107#76	Dry photo	480x510x220	216x355 mm	"	1500W	¥199,000
3M-233	"	460x415x205	B4	"	100V 20A	¥54,000
Yaesu Bussan: Duplomat 3	Diffusion transfer reversal	690x190x260	A3	"	140W	¥128,000
Duplomat 4	"	540x190x260	A4	"	90W	¥96,000

Make or distributor	Classification by type of operation	Size (mm)	Copy width	Copyable object	Light source	Price
Nihon Jimuki: Nicopist Hope	Diffusion transfer reversal	300x410x150	A4	Sheet	100W	¥29,000
Mitsubishi Seishi: Hishira Copy Printer	"	525x474x161	297x420	No limit	15 35W bulbs	¥35,000
Printer L	"	580x355x245	297x420 mm	"	15 35W bulbs	¥53,000
Processor	Combined with printer	477x195x137	A3	Sheet	20W	¥24,000
Lumo Print: L-400	Diffusion transfer reversal	615x270x165	"	"	Special lamp 75W	¥84,000

In addition to the above, the following are available on the market:

1. Polyfax from Zurich Co. (Switzerland):
   DIN A4/B & DIN A3/B.
2. Maruzen Photocopy from Maruzen Co., Ltd.

(3) Electro-static process copying machines

This type of copying machines make use of the photoconductivity of semiconductors.

i. Indirect method electro-static process copying machines

The indirect type static copying machine employs a semi-conductor sensitive plate by which an image is transferred to a sheet of paper.

ii. Major makes

(In thousandd of yen)

Make	Size (mm)	Type of copying	Copy width	Copyable object	Copying speed	Enlarge or reduce in size	Power requirement	Price
Bruning Model 2000	1244.6x 1117.6x 1219.2	Dry	A3	Sheet	14 per min.	1:1	100V28A	¥1,890
Model 2100	1162x 1207x 1080	"	A3	No limit	9 per min.	"	"	¥2,590

Make	Size (mm)	Type of copying	Copy width	Copyable object	Copying speed	Enlarge or reduce in size	Power requirement	Price
Xerox 660	508x711x 457	Dry	B4	Sheet	600 per min.	1:094	1.4kw	Rental system
Xerox 420F	1150x1160 1060	"	B4	No limit	600 per min.	1:1	"	"
Xerox 720	"	"	B4	"	720 per min.	1:1	"	Rental system
Xerox 2400	1650x790 1250	"	A4	"	2400 per min.	B4 can be reduced to A4.	4.5kw	"
Xerox 3600	1650x790x 1250	"	"	"	3600 per min.	"	5.0kw	"
Xerox 1860	2350x870x 2010	"	450x 1520 ~ 210x 210	Sheet	3m per min.	Can reduce by 50-100 % in 5 steps.	5kw 300V 30A	¥9,800
Xerox CFP	2350x700x 1300	"	210x 297	Continuous computer paper	2400 per min.	Reduce to A4.	200V 6kw	Rental system

In addition to the above, the following are available on the market:

1. Japan Addressograph Multigraph Co., Ltd.:
   a. Model AM 500 (Moist type)
   b. Model AM 2300 (Dry type)
2. Copyfax KIC 500 Auto.

iii. Direct method electro-static process copying machines

This type of copying machines use a sensitized paper coated with a photoconductive substance to which a positive image is directly transferred.

iv. Major makes (In thousands of yen)

Make	Size (mm)	Copy width	Type of copying	Copying speed	Copyable object	Sensitized paper	Enlarge or reduce in size	Price
Toshiba electronic copying machines								
Autofax BD-21	866x550x 887	B4	Moist	8 sheets per min.	No limit	Sheet or roll	Variable in 5 sizes	¥490
Autofax BD-11	916x495x 310	"	"	6 sheets per min.	"	Sheet	1:1	¥275
Autofax BD-31	990x520x 330	"	"	10 sheets per min.	"	Sheet or roll	1:1	Pending
Electronic Ricopy								
CS-1	730x450x 270	"	"	4 sheets per min.	"	Sheet	1:1	¥298
CS-2	905x515x 290	"	"	10 sheets per min.	"	Roll	1:1	¥488
CS-320	515x392x 268	"	"	6 A4 sheets per min.	"	Sheet (auto feed)	1:1	¥310
CS-22	725x250x 435	"	"	4 sheets per min.	"	Sheet	1:1	¥245
2	1165x606x 835	"	Dry	2 sheets per min.	"	"	1.2 - 0.7	¥1,500

In addition to the above, the following are available on the market:

1. Electronic Copyster Models 207 & 211.
2. Minoltafax Models 41, 2100, 2500 & 7100.
3. Remington electronic copying machine Model R3.

(4) Thermal copying machines

This type uses a sensitized paper coated with ferric salt to which a positive image is directly transferred with the aid of heat from an infrared ray source.

i. Major makes (In thousands of yen)

Make	Size (mm)	Copy width	Copyable object	Power requirement	Price	Remarks
Aihina Dry Copy 102	430x280x110	B4	Sheet	1.5kw	¥138	Makes master for liquid printer in 4 seconds.
Ormig Thermograph Model 2	430x330x130	A4	"	"	¥129	"
Ormig Thermograph Model 3	540x330x140	A3	"	1.8kw	¥270	"
Gestfax Junior TH4	463x336x127	26cm	"	100V13A 1.45kw	¥100	"
Gestfax Junior TH5	463x336x127	"	"	"	¥100	"
Thermofax Model 45	490x390x190	A4	"	1500W	¥169	Can make film for O.H.P.
Duplofax F-800	490x310x200	A4	Sheet	1500W	¥163	Can make film for O.H.P.
Duplofax R-631CS	548x336x200	B4	Sheet up to 5mm thick	2kw	¥148	Can make master for liquid printer and film for O.H.P.

(5) Other copying machines

i. Facsimile master preparation machines

A manuscript and master paper are to be wound together on a single cylinder and a photoelectric tube is used to scan the manuscript in a discharge breakdown method to make a master.

(In thousands of yen)

Make	Size (mm)	Master size (mm)	Scan density	Drum speed (rpm)	Power requirement	Price
Gakkenfax GOM-208	740x360x240	290x 340	13 lines per mm	300	150W	¥148
Gakkenfax GOM-308	754x387x294	250x 340	"	"	170W	¥178
Gestfax ES390 Mark II	635x395x230	360x 217	Variable in 4 steps	Faster than others	100V2A 0.2kw	¥298
Senafax 350W	685x380x190	257x 364 B4	120 lines per cm	250	100W	¥155
Senafax 750W	685x380x190	"	140 lines per cm	300	150W	¥208
Duplofax R313M	750x340x190	240x 350	13 lines per mm	300	75W	¥145
Toshafax V-250	760x330x180	240x 350	100 lines per cm	250	100W	¥125
Toshafax H-300V	760x345x280	260x 350	"	300	130W	¥205
Toshafax M-305	760x370x205	240x 350	13 lines per mm	"	110W	¥173
Rex Rotary 2000	820x345x210	B4	100 lines per cm	"	170W	¥198
Rex Rotary 2200	835x345x195	"	50 - 300 lines per cm	"	230W	¥295

In addition to the above, the following is available on the market:

Risofax JF3, a thermal instantaneous facsimile preparing machine using an infrared ray lamp: Size of the machine, 500 x 330 x 260mm; facsimile master size, B4; master making speed, 5 to 10 seconds; power requirement, 5.1kw; price, ¥198,000.

ii. Photographic plate making machines

These machines are used for preparing photographic plates by the photo method using silver emulsion.

A. Major makes

a. Itek Plate-Master 910

Size, 840 x 990 x 1020mm; enlargement, 1:1; original copy size, 254 x 360mm; preparing speed, 2 plates per minute; plate size, 395 x 230mm; price, ¥1,850,000.

b. Itek Plate-Master 10-15

Size, 1220 x 1980 x 1805mm; enlargement or reduction in size, 50 - 110%; original copy size, 510 x 710mm; preparing speed, 3 plates per minute; plate size, 254 x 510mm; price ¥2,760,000.

c. Itek Plate-Master 12-18

Size, 1370 x 2140 x 1980mm; enlargement or reduction in size, 45 - 150%; original copy size, 1000 x 676mm; preparing speed, 3 plates per minute; plate size, 350 x 508mm; price ¥3,950,000.

d. Aitec Plate-Master 20-24

Size, 1575 x 2400 x 2400mm; enlargement or reduction in size, 50 x 110%; original copy size, 915 x 1220mm; preparing speed, 2 plates per minute; plate size, 510 x 710mm; price, ¥6,750,000.

e. DSF-16-B Companica -- small-sized camera for making plates for printing

Size, 1950 x 900 x 1500mm; lenses, f=26cm, f=21cm; original copy size, 460 x 610mm; enlargement or reduction in size, 3 - 1/3; plate size, 350 x 430mm; price varies depending on specifications.

f. Polaroid photo-plate line-drawing copying device MP-3

Size, 889 x 702 x 1471mm; screen, 65 lines, 85 lines, 100 lines, 120 lines; lenses, 127mm f-22, f90; film size, 4 x 5"; price, ¥427,000.

g. AM master preparing machine (Robertson Meteorite Camera Model MTD-10)

Size, 1651 x 800 x 1613mm; original copy size, 584 x 457mm; plate size, 254 x 419mm; enlargement or reduction in size, 50 - 200%, lens, F9; power source voltage 100V, price, ¥1,099,000.

h. Robertson Meteorite Camera Model MTD-20

Size, 1650 x 786 x 1600mm; original copy size, 460 x 580mm; plate size, 279 x 507mm; enlargement or reduction in size, 50 - 200%; power source voltage, 100V, price, ¥1,414,000.

i. Photo Direct Camera Processor Model 705Q

Size, 2031 x 1015 x 1701mm; original copy size, 482 x 609mm; plate size, 279 x 457mm; enlargement or reduction in size, 50 - 150%; power source voltage, 100V; price ¥3,548,000.

j. Automatic Exposure Cabinet Model 1480

Size, 584.2 x 880 x 1276.3mm; plate size, A3; light source, 250W mercury lamp; power source voltage, 100V; price, ¥358,000.

iii. Electro-static plate making machines

These machines are used for preparing plates by making use of the photoconductivity of semi-conductors.

Major makes:

a. Elefax PC-301

Size, 750 x 1500 x 1860mm; original copy size, A3; plate size, B4; enlargement or reduction in size, 70 - 140%; lens, Nihon Kogaku Apponikkor f=300, F=9; power requirement, 1.2kw; price ¥780,000 (PC-301W is priced at ¥830,000.)

b. Ricoh Electronic Printer S-1

Size, 770 x 470 x 370mm; original copy size, B4; plate size, B4; enlargement or reduction in size, 1:1; price, ¥370,000 (including fixer).

5. Conclusions

I have explained to you about the kinds and functions of copying machines that are commercial available today and are in wide use. As you are aware, no matter how good a copying machine may be, it cannot produce satisfactory result unless it is properly controlled and operated.

The Office Management Section of the Toshiba Tokyo Office organized the Printing Office in March 1960 for the purpose of improving our copying and printing operations as a part of the programme designed to streamline our office work system, and established a system by which our copying and the light kind of printing work might be carried out. The Printing Office has fared well for over nine years since. Now I am going to show you an outline of our operations for your information.

1. Circumstances prior to the existence of the Printing Office

Before the Printing Office came into existence, each section and department had its own typewriters, diazo copying machines and hectograph machines to take care of its own copying and printing needs and, where outside help was required, would send out manuscripts or original copies to the contractors. Since the technical capacity of these sections and departments to handle their own copying and printing was rather limited, they had to rely considerably on the outside contractors, and this inevitably involved problems as regards the prevention of leakage of confidential information and the punctuality of delivery. Improvement of such a situation was badly needed.

2. Targets of improvement

To meet the above-mentioned need for improvement, a programme involving the following targets was drawn up.

A. Keeping confidential information from leaking out

This was the biggest target of the programme. So the programme was specifically designed to do at least the required minimum amount of copying and printing work within our company. At the same time, the programme called for the removal of printing contractors permenently stationed at Toshiba.

B. Having a printing office within the company is an advantage, particularly in view of the difficulty of getting punctual deliveries from printing contractors and of the inconvenience involved in proofreading.

C. Improvement of the reliability and quality of printing service

This can be best assured by creating one's own printing office.

D. Saving printing costs

Though a target of secondary significance, the reduction of printing costs must also be taken into account.

3. Centralized and de-centralized control

In addition to the idea of centralizing our copying and printing operations by setting up a printing office along the lines described above, what steps should be taken about the machines and instruments used by the individual sections and departments was also studied.

The centralized control system should assure the highly efficient operation of copying and printing services because it would be operated by experts, and allow the use of the latest high-efficiency equipment.

However, it would be inefficient to centralize such small copying or printing work that might well be handled by use of a machine on hand in the section or department concerned.

For this reason, it was decided that typewriters, diazo copying machines and hectograph machines be kept, or even increased in the future, in the individual sections and departments.

The centralized and de-centralized control of copying and printing operations in the Toshiba Tokyo Office was an appropriate step which proved to be one of the most important factors for the success in modernizing our documentation system.

4. Scale of the Printing Office

The central Printing Office must be large enough to attain the aforementioned targets.

It must be able to satisfy, both in quantity and quality, the needs for reproducing or printing such confidential information as must never be allowed to leak out. It must be able to do so in time. In addition to these requirements, the scale of the Printing Office must be correct in point of economy. That is, it need not be any larger than that. As a matter of fact, we are not a printing company.

With these requirements in mind, we worked out the details of the Printing Office, whose scale and general description are shown in Table 1.

Our Printing Office is 356 square meters in total floor space, with a work force of 63 (authorized number). It is a general copying and printing office undertaking the light kind of reproduction services, with its equipment including typewriters, photo typesetting machines, microfilms, diazo copying machines, electro-static copying machines, offset printing machines, stencil mimeograph machines and various other types of reproducing and printing devices.

5. Centralized control of copying and printing operations

When the Printing Office came into being, it took charge of the control of copying and printing operations.

While the individual sections and departments still handled minor reproducing work with their own machines, all other kinds of copying and printing work that were too much, or would be inefficient, for them to handle were to be taken to the Printing Office. They would no longer send them to outside contactors.

When the Printing Office receives a request for copying or printing from a certain section, we determine what type of process should be taken depending on the kind of the manuscripts or original copy and the number of copies required. Part of the work requested by the sections and departments is sent to outside contractors.

In other words, the Printing Office controls, on its own responsibility, all the copying and printing work requested by them. This kind of system provides great convenience for the originating sections and departments and, at the same time, allows us to maintain our work volume at a constant level because we can use outside contractors at our discretion.

6. Copying and printing costs are charged to the requesting sections and departments.

These costs are charged to the accounts of the requesting sections and departments each month on the basis of the rates which were properly determined. Because the Printing Office is regarded as an economic unit. The idea is that the expenses of the Printing Office should be covered by its "sales", or the costs charged to the requesting sections and departments. Determined by careful discussion among the persons concerned, the copying and printing rates are based on labor and material costs, expendables costs, machine repair expenses, machine depreciation, and power costs. The rates are revised as deemed most appropriate from time to time. Generally, they are lower than prevailing commercial levels. This is especially true of microfilm copies, diazo copies and offset print copies which require a high degree of mechanical processing.

This is an important factor to bear in mind, particularly in examining the relationship between the scale and economy of a printing office.

7. Important points in the operation of a copying center

To run a copying center organized as a result of such studies as mentioned above requires attention to some points if it is to meet the expectations. They are as follows:

A. Operating rate

It is often required to meet an emergency need to reproduce confidential documents in a limited time. In such a case, priority is given to it at the sacrifice of whatever we have our hands in. In our particular case, such emergencies can come any time, so that we have some extra capacity at all times to meet them whenever they occur. This extra capacity is a problem in that it is incompatible with economy, and requires special considerations to make it less uneconomical.
At any rate, sufficient control is important to keep a close what on what's going on in the printing office.

B. Control of the employees

Our Printing Office is located in the same building as the Toshiba Tokyo Office, but is different from the other sections and departments in that ours isn't general desk work. We must see to it that no inferiority complex arises among the workers in the printing office because of this difference. That's why I tell my people to have a pride in their work because it is just as important a part of the overall operations of Toshiba as selling and accounting and personnel administration. Great attention is paid to the prevention of leakage of confidential information handled in our Printing Office. Another important thing is that we train our people in such a way that any one of them can handle any kind of machine so that we don't have to lay some machines at idle when som one takes leave. Centralized control is especially convenient in training operators in this manner.

8. Effects resulting from the organization of the Printing Office

Looking back upon the nine and a half years of existence of our Printing Office, I notice some side effects which did not seem to be so important in the original programme. The important effects obtained are as follows.

A. Convenience of requesting sections and departments

Whether their copying or printing work be handled within the company or be sent out to contractors, all they have to do is request the Printing Office to take care of it. This means great convenience on the part of the sections and departments requesting it.

B. Copying and printing expenditures of each section or department are now clear.

Although each section or department had a budget for its copying and printing work prior to the opening of the Printing Office, there were no detailed figures as to the individual items of copying and printing work. Now that definite figures are available, they can take whatever steps necessary for improving the way to meet their copying and printing needs.

C. Greater awareness of cost

Centralized control has enabled us to give advice, if necessary, as to what method would be most effective and most economical at the same time. This has helped to arouse costconsciousness among the Toshiba employees at large.

D. Diffusion of the knowledge of copying and printing

In connection with the foregoing explanation about giving advice, we have also helped the Toshiba people to increase their knowledge about copying and printing processes, the time required, their costs, and their finish. Such knowledge is helpful, in each section and department, to arrange their work systematically on the basis of it.

F. Control of work slips

Our Printing Office receives requests for large quantities of work slips. Since the Printing Office is under the supervision of the Office Work Control Section, it can provide pertinent advice on the design of work slips.

10. Conclusions

As I have explained to you about the modernization of our copying and printing operations at the Toshiba Tokyo Office, any printing office must be designed to meet the specific needs of the company to which it belongs.

In our particular case, we had thoroughly studied the circumstances involved; worked out specific targets; decided to use both centralized and individual control of copying and printing services; determined the correct scale of the printing office; and took appropriate steps in running the office. All this, I believe, has added up to the successful operation of our Printing Office.

Paper sizes (in mm)

A	No.	B
840 x 1188	0	1030 x 1456
594 x 840	1	728 x 1030
420 x 594	2	515 x 728
297 x 420	3	364 x 515
210 x 297	4	257 x 364
148 x 210	5	182 x 257
105 x 148	6	128 x 182

Attached Table 1

General information on the Printing Office of the General Affairs Section, Administrative Department

1.	Location	9th floor, Hibiya Telegraph & Telephone Corporation Building
2.	Floor space	356.2 square meters
	Office	34.5 square meters
	Typing Room	119.7 square meters
	Printing Room	124.0 square meters
	Dark Room	78.0 square meters
	Supply Room	3.2 square meters

In addition to the above, there is the storage room of the Printing Office, about 4 square meters in floor space, on the second basement floor, where ammonia developers, waste, chemicals, etc. are stored.

3. Work force: 60 men and women

	Male	Female	Total
Administrative	2		2
Receptionist		2	2
Clerical		1	1
Typing supervision		2	2
Japanese typing		23	23
Tracing	1	1	2
Photo type setting	1		1
Photo copying		2	2
Ricopy	4		4
Zerox	1	1	2
Phototype process	2		2
Thermal copying		2	2
Mimeograph	2		2
Flat-bed printing	3		3
Bookbinding	5		5
English typing		3	3
Microfilm	2		2
Total	23	37	60

Tokyo Shibaura Electric Co. Ltd., as of July 1970

Description of the equipment in the Toshiba Printing Office

Printing Room

1. Higo
2. Higo type punching machine
3. Higo type card punching machine
4. Rotaprint RT4
5. Rotaprint RT35
6. Gestetner mimeograph machine
7. Thermal copying machine
8. Banda mimeograph machine
9. Minami type automatic wire binder
10. Binding machine
11. Punching machine
12. Photo typesetting machine SK4-E
13. Helotype S printing paper drier
14. Laminator
15. Quickcopy
16. Autofax BD-31
17. Autofax BD-21
18. Table for paper handing
19. Paper shelf
20. Chemical shelf
21. MS shredder
22. Cabinet
23. Supply shelf
24. Locker
25. Administrative officer
26. Clerk
27. Receptionist
28. Counter
29. Finished items shelf

(A)

1. Ricopy FP810
2. Ricopy OM2
3. Ricopy OM1
4. Sensitized paper shelf
5. Table for paper handling

(B)

1. Table for paper handling
2. Risofax
3. Vacuum printer
4. Work bench
5. Sink
6. Printing paper drier HD-100

(C)

1. Quickcopy Auto Processor
2. Xerox 1318 (combined with plate-making camera)
3. Microfilm drier
4. Sink

(D)

1. Xerox 1318 transfer unit
2. Xerox 1318 charge unit
3. Xerox 1318 develop unit

(E)

1. Table for paper handling
2. Mitsubishi Hishiracopy
3. Processor

(F)

1. Xerox 1385 Auto Processor
2. Xerox 1385 VR camera
3. Xerox 1385 heat fuser
4. Xerox 1385 gas fuser
5. Table for paper handing
6. Light table

(G)

1. Micro camera Rumo Print MT-1
2. Table for paper handing
3. Printing paper table
4. Refrigerator

(H)

1. Microfilm enlarger MVG-M

(I)

1. Sink
2. Microfilm auto processor
3. Photo enlarger Fuji AS2

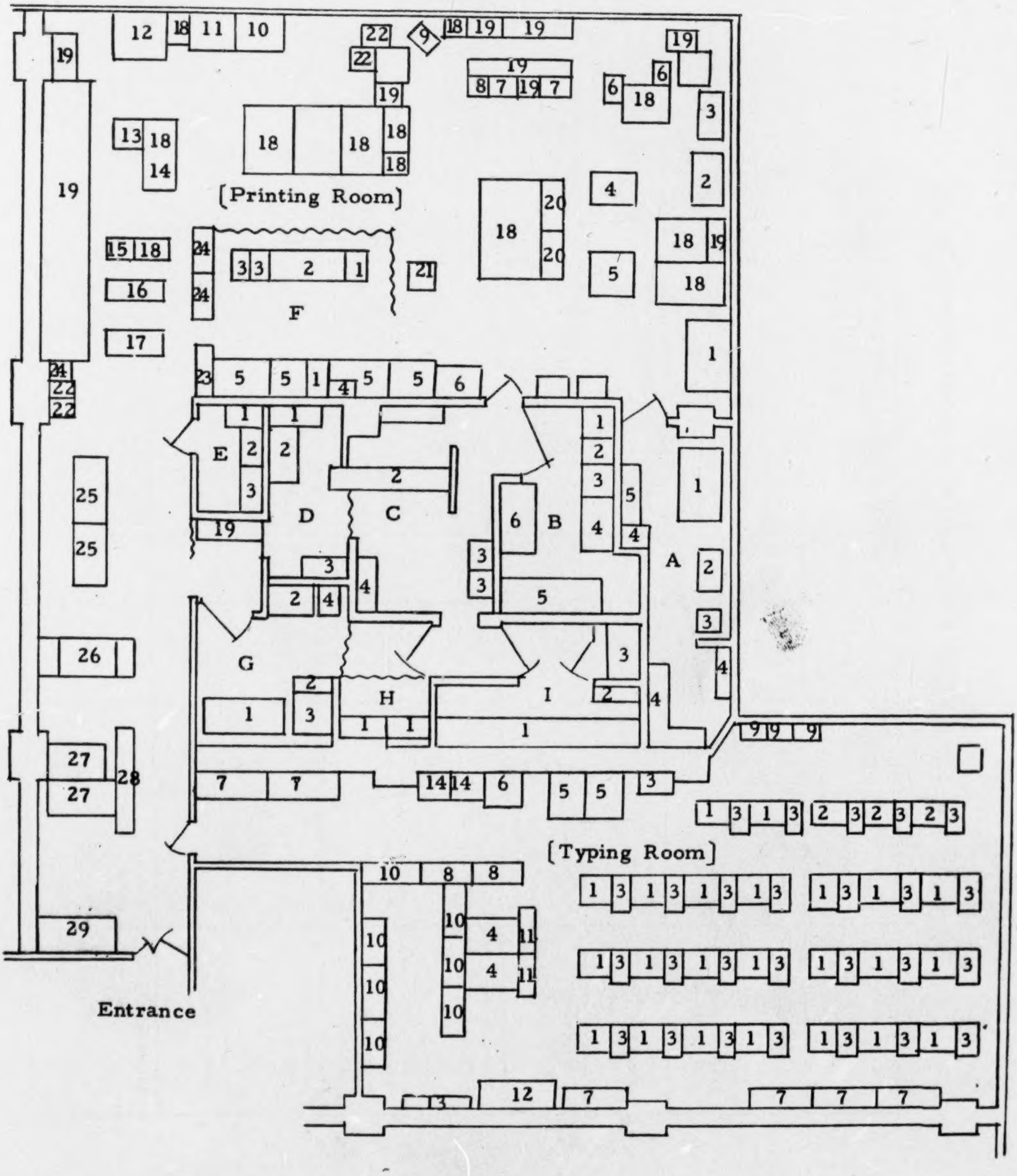
Typing Room

1. Japanese typewriter Towa BSD3058
2. English typewriter IBM Executive
3. Typing side desk
4. Tracing desk
5. Typing Room receptionist
6. Proofreading of typed papers
7. Supply shelf
8. Paper shelf
9. Type storage
10. Locker
11. Light table
12. Sofa
13. Mirror stand
14. Microfilm cabinet

KINDS OF COPYING AND PRINTING PROCESSES AND THEIR CHARACTERISTICS

Kind	Original	Speed		Cost (A4 size)		Appropriate No. of copies ├──┤ Maximum No. of copies ├- - -┤	Quality of finish	Characteristics
		Preparing original	Copying or printing	No. of copies	Cost			
Carbon copying	Handwriting or typing	Slow	Fast		3 yen per sheet of carbon paper	1 5 12 ├──┼- - -┤	×	High cost in case of typing.
Liquid (Hecto) mimeographing	Same as above	Slow	Fast		11 yen per sheet of Hecto carbon	2 5 150 ├- - -┼──┤	O	Easy to handle and economical.
Stencil mimeographing	Stylus or typing	Slow	Fast	500	1 yen per copy (excl. paper cost)	10 50 1000 ├- - -┼──┤	O	Most economical when making over 100 copies. Little difference in cost whether original is made by use of stylus or typewriter.
Diazo process copying	Inapplicable to double-faced or non-clear print		Fast	1	5 yen (55kg sensitized paper)	1 10 ├──┼- - -→	O	Easy to handle. Direct copying from original print possible.
Static process copying	Applicable to double-faced print		Fast	1	Indirect method: 40 - 50 yen Direct method: 20 - 25 yen	1 - 2 ├- - - - -→	×	Indirect method is unsuitable for copying photos. Direct method produces satisfactory copies of photos.
Offset printing	Paper or aluminum master	Fast	Fast	500	2 yen per copy (excl. paper cost)	10 100 ├- - -┼──→	O	Good finish is obtained. Photos can be copied. Suitable for making large numbers of copies.
Diffusion transfer reversal process copying	Applicable to double-faced print	Fast	Fast	1	50 yen per sheet of positive paper; 70 yen per sheet of positive film	1 - 2 ├- - - - -→	×	Suitable for making 1 copy or 2. Economical when combined with diazo process. No enlargement or reduction in size possible.
Thermal copying	Applicable to sheet material		Fast	1	30 - 50 yen	1 - 2 ├- - - - -→	×	Economical when combined with liquid mimeographing machine.
Microfilm	Same as above	Fast	Slow	1	10 yen for preparing 35 mm film; 40 yen for enlarging on CPE printing paper	1 - 2 ├- - - - -→	×	Economical when combined with diazo process. Enlargement and reduction in size possible. Microfilm itself can be used for visual reference.

Layout of the Toshiba Printing Office


[Printing Room]
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Entrance
A
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Distribution: limited

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TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

MEDLARS

- Medical Literature Analysis and Retrieval System -

Tamiko Matsumura
Kitasato Memorial Medical Library
School of Medicine, Keio University

1. MEDLARS: GENERAL INTRODUCTION

1.1 Background and History

MEDLARS, an acronyms of Medical Literature Analysis and Retrieval System, is a computer-based system in operation at the National Library of Medicine. It has been designed to achieve rapid bibliographic access to the Library's vast store of biomedical journal information. It became operational in January 1964 with the publication of the first computer-produced issue of Index Medicus, a comprehensive subject-author index to **articles** from approximately 2,300 biomedical jurnals published elsewhere in the world.

The Library initiated its programme of bibliographic control of the medical literature in 1879 with publication of the first issue of Index Medicus, which continued until 1927 when it was replaced by the Quarterly Cumulative Index Medicus published by the American Medical Association until 1956. In 1960, Index Medicus reappeared as a Library publication, replacing the monthly Current List of Medical Literature.

From 1960 to 1963, Index Medicus was produced by a partially mechanized system which utilized paper type typewriters, punched card equipment, and a Listomatic Camera. This system worked efficiently in the publication of Index Medicus and related publications, however, it had limitations especially in information retrieval capability. Because of the limitations and also of the rapidly growing size of biomedical literature, the Library decided to develop a new and more highly mechanized system. In 1961, a contract was awarded to the General Electric Company, Information Systems Operation, Bethesda, Maryland, U.S.A. After three-year of planning, and testing, the new system was accomplished in January 1964 and it has since been in operation continuously.

1.2 System Objectives

The principal objective of MEDLARS is to provide references to the biomedical literature to researchers, clinicians, and other health professionals in the world. This is accomplished through:

(1) Preparation of citations for publication in Index Medicus and Current Catalog (See Table 1: List of NLM publications).

(2) Preparation of Recurring Bibliographies on specialized subjects of wide interest (See Table 2: List of Recurring Bibliographies).

(3) Preparation of retrospective, one-time bibliographies (demand searches).

This is achieved by rapid search through the file of citations to journal articles in response to specific requests submitted by health professionals.

1.3 Overall Data Flow

As shown in Figure 1, the system can be described functionally as consisting of three major parts: an Input Subsystem, a Retrieval Subsystem, and a Publication Subsystem.

The Input Subsystem combines the intellectual talents of trained literature analysts with the processing and storage capabilities

Table 1

MEDLARS Publications (as of May 1970)

Name	Description	Frequency
Index Medicus	Comprehensive listing of articles indexed--major library reference tool	Monthly
Cumulated Index Medicus	Cumulation of monthly issues	Annual
Abridged Index Medicus	Abridgement based on articles from 100 English-language journals designed for the needs of the individual practitioner and libraries of small hospitals and clinics	Monthly
Medical Subject Headings	Alphabetic and categorized list of subject headings used in MEDLARS indexing	Annual
List of Journals Indexed in Index Medicus	Journals indexed for Index Medicus listed by title abbreviation, full title, major subject areas, and country of origin	Annual
Monthly Bibliography of Medical Reviews	Listing of review articles in monthly Index Medicus	Monthly
NLM Current Catalog	List of books, serials, and reports cataloged	Biweekly with quarterly cumulations

Table 2

NATIONAL LIBRARY OF MEDICINE RECURRING BIBLIOGRAPHIES*

The National Library of Medicine, through its computer-based MEDLARS (Medical Literature Analysis and Retrieval System), periodically produces lists of citations to journal articles in specialized biomedical fields. Most of these lists, termed "Recurring Bibliographies," are printed and distributed by nonprofit professional organizations and other government agencies with whom the Library cooperates.

(1) The Bibliography on Medical Education is published monthly in the Journal of Medical Education ($15 per year). Cumulations for 1964-65 and 1966 are available from the American Association of Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois 60201, for $2.00 each.

(2) The quarterly Cerebrovascular Bibliography is prepared under the auspices of the Joint Council Subcommittee on Cerebrovascular Disease, National Heart Institute, National Institutes of Health, Bethesda, Maryland 20014. Distribution is limited. For information write to the Executive Secretary, Joint Council Subcommittee on Cerebrovascular Disease.

(3) The monthly bibliography, Fibrinolysis, Thrombolysis, and Blood Clotting, is distributed by the National Heart Institute. For information write to Dr. James M. Stengle, National Heart Institute, National Institutes of Health, Bethesda, Maryland 20014.

(4) The monthly Inder of Rheumatology is available from the American Rheumatism Association Section of The Arthritis Foundation, 1212 Avenue of the Americas, New York, New York 10036. Price: $6 per year ($7 foreign); $3.50 to members of the American Rheumatism Association.

(5) The quarterly Index to Dental Literature is sold by the American Dental Association, 211 East Chicago Avenue, Chicago, Illinois 60611. Price: $20 for four cumulative issues, (including annual cumulation); $10 for annual cumulation alone.

(6) The quarterly International Nursing Index is sold by the American Journal of Nursing Company, 10 Columbus Circle, New York, New York 10019. Price: $15 for four cumulative issues (including annual cumulations.) $12.50 for annual cumulations.

(7) The quarterly Artificial Kidney Bibliography is published by the National Institute of Arthritis and Metabolic Diseases. For information write to the Scientific Communications Officer, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Maryland 20014. The bibliography is sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price: $1.00 per year ($1.25 foreign); single issues, $0.30.

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* from Index Medicus, May 1970.

(8) The bimonthly Endocrinology Index is published by the National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Maryland 20014. The bibliography is sold by the Superintendent of Document, U.S. Government Printing Office, Washington, D.C. 20402. Price: $16 per year ($20 foreign); single issues, $2.75

(9) The Bibliography of Surgery of the Hand, a quarterly, is published and distributed by the American Society for Surgery of the Hand. For information write to John P. Adams, M.D., Chairman, American Society for Surgery of the Hand, 2150 Pennsylvania Avenue, N.W., Washington, D.C. 20037.

(10) The Anesthesiology Bibliography, a bimonthly, is published and distributed by the American society of Anesthesiologists. For information write: Wood Library, Museum of Anesthesiology, American Society of Anesthesiologists, 515 Busse Highway, Park Ridge, Illinois 60068.

(11) The quarterly. Toxicity Bibliography is published by the National Library of Medicine and distributed by the Superintendent of Document, U.S. Government Printing Office, Washington, D.C. 20402. Price: $14.00 per year ($17.50) foreign); single issues, $3.50.

(12) The monthly Current Bibliography of Epidemiology (CuBE) is published by the American Public Health Association. For information write to the Editor, CuBE, American Public Health Association, 1740 Broadway, New York, New York 10019.

(13) The Neurosurgical Biblio-Index, a quarterly, is published by the American Association of Neurological Surgeons. For information write to the Subscription Manager, Journal of Neurosurgery, Suite 1230, 251 East Chicago Avenue, Chicago, Illinois 60611.

(14) The Cranio-Facial--Cleft Palate Bibliography is published quarterly by the American Cleft Palate Association. For information write to the Chairman, Nomenclature Committee, Box 3098, Division of Plastic, Maxilofacial and Oral Surgery, Duke University Medical Center, Durham, North Carolina 27706.

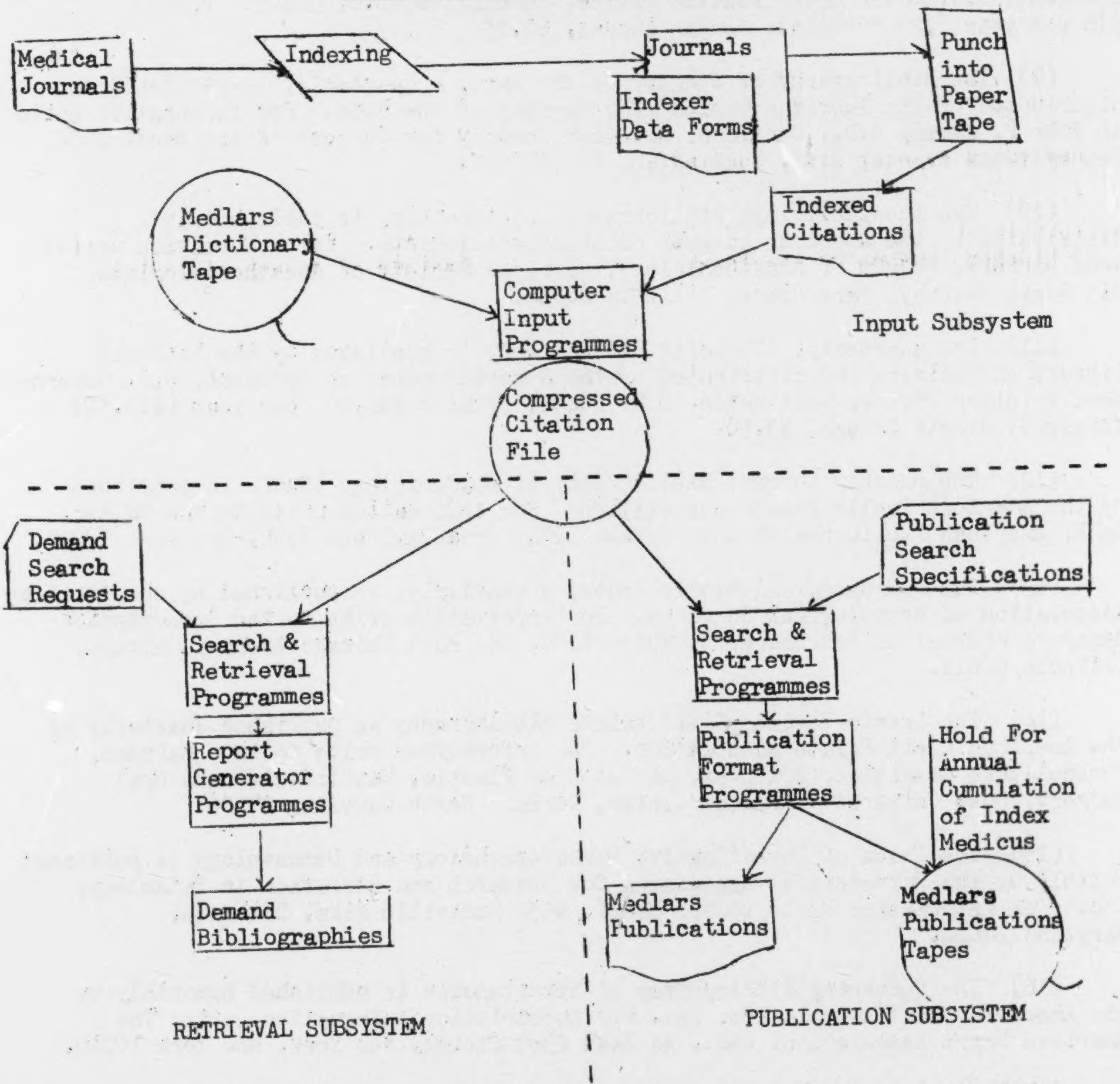
(15) The Index of Investigative Dermatopathology and Dermatology is published monthly by the Universities Associated for Research and Education in Pathology, Inc. For information write to the UAREP, 9650 Rockville Pike, Bethesda, Maryland 20014.

(16) The Recurring Bibliography of Hypertension is published bimonthly by the American Heart Association, Inc. For subscription information write: The American Heart Association, Inc., 44 East 23rd Street, New York, New York 10010.

(17) Requests for the annual Recurring Bibliography on Education in the Allied Health Professions should be addressed to: Dr. Kathryn Schoen, Assistant Director, School of Allied Medical Professions, The Ohio State University, 410 West 10th Avenue, Columbus, Ohio 43210. Price: $1.00 per copy.

Figure 1

Medlars System Overall Data Flow Chart*


Medical Journals
Indexing
Journals
Indexer Data Forms
Punch into Paper Tape
Indexed Citations
Medlars Dictionary Tape
Computer Input Programmes
Input Subsystem
Compressed Citation File
Demand Search Requests
Publication Search Specifications
Search & Retrieval Programmes
Search & Retrieval Programmes
Report Generator Programmes
Publication Format Programmes
Hold For Annual Cumulation of Index Medicus
Demand Bibliographies
Medlars Publications
Medlars Publications Tapes
RETRIEVAL SUBSYSTEM
PUBLICATION SUBSYSTEM

* Austin, C.J. MEDLARS 1963-67. Bethesda, Md., National Library of Medicine. p. 10.

of the computer. New medical journals checked in at the Library are forwarded to the Index Section, where the analysts index the subject content of each article in the journals by assigning appropriate descriptors from the system's controlled list of terms, Medical Subject Headings. The indexer data sheets are attached to journals and they are forwarded to the Input Section, where flexowriter typists prepare punched paper tape input for the computer. The basic unit record consists of the article's title, author names, journal references, and subject headings assigned by the indexer. The punched paper tape is accompanied by typewritten copy to be used for sight-verification by a staff of proofreaders. Once a day, all corrected paper tapes are batched and spliced together for entry into the computer. The input computer programmes accept the paper tape, edit the data extensively, and prepare the major data file, that is, the Compressed Citation File (CCF). It is a highly coded, time-sequential store of citations used for searching and retrieval for both individual demand searches and MEDLARS publications.

The Retrieval Subsystem starts with the receipt of a request for a demand search. The requests are forwarded to a staff of search specialists, who formulate the request into a list of search parameters linked in logical fashion by up to three search statements. The formulated search requests are punched into cards and batched for daily computer processing. In search and retrieval programmes, a batch of search questions are matched against every record in the Compressed Citation File. The citations retrieved are printed in any one of a variety of output formats by means of print programmes. The resulting lists of citations are referred to as "demand bibliographies".

The Publication Subsystem is concerned with preparation of printed indexes. In accordance with a publication schedule, search specification cards are entered into the computer for bibliographies to be compiled. The search and retrieval programmes retrieve the appropriate citations from the CCF, and the publication format programmes set page composition and prepare a magnetic tape file of one-line print records for a computer phototypesetter. This tape is used to convert the digital information from magnetic tape to characters on photographic film or paper. The exposed film or paper is developed by an automatic processor, inspected, cut into page-sixe sheets, and packaged for mailing to the printer. The resulting typeset pages are used directly for printing the final publication.

Besides the aforementioned data flow, the system is also provided with various utility programmes for updating master file and preparing statistical reports used for management control. Current computer equipment includes a Honeywell-800 computer used for main precessing and a satellite Honeywell-200 for the slower input/output operations. Publications are prepared for printing by the Photon 900 Computer Phototypewetter commonly called GRACE (GRaphic Arts Composing Equipment). It is an off-line photocomposer which prints from a font of 226 characters onto nine-inch-wide posotive photographic film or paper. It operates at a speed of 1.7 lines or approximately 300 characters per second. The character set of GRACE includes a 6-point font, regular and boldface, upper and lowercase, with a large subset of special characters including diacritical marks for foreign languages, a 10-point font for uppercase and boldface, and a 14-point font for uppercase and boldface.

1.4 File Contents

As of August 1969, the MEDLARS magnetic tapes contain more than 1,000,000 citations to articles published since 1963.(1) Citations were first input at the rate of 11,000 per month in 1964 but increased to the average of 20,000 per month in mid-1969 and have been growing further. The articles from approximately 2,300 biomedical periodicals are currently indexed and about one half of these articles are in languages other than English. In the selection of journals for indexing, advices are given by a group of distinguished physicians, medical editors and librarians. The indexed journals are listed in the January issue of Index Medicus and also separately published List of Journals Indexed in Index Medicus.

Each citation in the MEDLARS file contains a number of elements. The following are those which appear in the printout of a Demand Search:

1. Author's names.

2. English title and/or English translation and vernacular.

3. Abbreviated journal title.

4. Volume, page, date of publication.

5. Language abbreviation for articles other than those in English.

6. Subject headings describing the contents of the article, including type of article such as review, case report, in vitro studies, human or animal studies.

Example

1
SIEDLECKI JT
4 6 5
2—POTENTIAL HEALTH HAZARDS OF MATERIALS USED BY ARTISTS AND SCULPTORS.
3—JAMA 204:1176-80, 24 JUN 68 ( ) ( )
7— ACRYLIC RESINS, *ART, ENVIRONMENTAL EXPOSURE (3), HUMAN (4), LEAD/ TOXICITY, METALS, *OCCUPATIONAL DISEASES, *PAINT/TOXICITY, SILICA, SOLVENTS, WELDING, WOOD

*) Indicates the headings under which the citation appears in Index Medicus.

/) Connects subject heading with associated subheading.

2. MEDICAL SUBJECT HEADINGS

2.1 Definition

Medical Subject Headings (hereinafter referred to as MeSH) is the National Library of Medicine's authority list of technical terms used for indexing journal articles, cataloging books and biliographic search of the Library's computer-based citation file. MeSH terms appear in Index Medicus, the NLM Current Catalog and in the recurring bibliographies prepared by the Library, with pertinent citations printed under them. It is a controlled vocabulary consisting of approximately 7,500 subject headings, each defined to represent a sepcific concept in the biomedical field, some 250 geographical headings (place names), some 500 provisional headings which are new terms in trial use for consideration for inclusion as main headings and 60 subheadings used in combination with main headings at the indexer's option.

2.2 Scope and Coverage

The scope of medicine itself and the extent to which knowledge in other scientific disciplines iminges upon it has been, and still remains as a serious problem. The decision made by the National Library of Medicine is no more than arbitrary. However, it defines to include in MeSH the following concepts:

1. organs, tissues, cells, regions
2. diseases
3. drugs, chemicals, endogenous, biological and other substances

Figure 2

MESH ALPHABETICAL LIST AND CROSS REFERENCES

PALPATION (E1) ←——————— main heading

Paludrine see CHLOROGUANIDE (D3)←——————— see reference

2-Pam see under Pralidoxine Compounds (D5)←— see under reference

PAMPHLETS (L)

PANCOST'S SYNDROME (C2)

PANCREAS (A3)

PANCREATECTOMY (E4)

PANCREATIC CYST (C2)

Pancreatic Cystic Fibrosis see Cystic
Fibrosis (C4, C5, C16)

PANCREATIC DISEASES (C4)
see also related
Hyperinsulinism (C7) ← see also related reference

PANCREATIC DUCTS (A3)

PANCREATIC EXTRACTS (D12)
see also related
Pancreatin (D7, D9)

PANCREATIC FISTULA (C4)
Xs Fistula (C17)

PANCREATIC JUICE (A12)
see also specific
Chymotrypsin (D9) ← see also specific reference
Rennin (D9)
Trypsin (D9)

PANNICULITIS, NODULAR
NONSUPPURATIVE (C12)
X Weber-Christian Disease (C12) ← see from reference

Panolid see Ethybenztropine (D5)

PANOPHTHALMITIS (C11)

Pantopon see under Opium (D2, D6)

PANTOTHENIC ACID (D11)

PAPAIN (D9)

PAPAVER (B6)
see also specific
Opium (D2, D6)

PAPAVERINE (D2, D5)

PAPER (J)
Xu Watermarks (J) ← see under from reference
Xr Cellulose (D11) ← see also related from reference

PAPILLARY MUSCLES (A7)

PAPILLEDEMA (C11)
Xr Intracranial Pressure (G1)
Xr Ophthalmoscopy (E1)
Xs Edema (C17) ← see also specific from reference

4. Living organisms; microorganisms, higher animals, plants

5. procedures; diagnostic, therapeutic, surgical, anesthetic, analytic

6. physiological processes

7. biomedical fields and disciplines and those who are engaged in them

8. miscellaneous medical and paramedical concepts

9. minimum of physical, sciences, social sciences, humanities, industry and communication

2.3 Structure

MeSH consists of two parts: (1) an alphabetical list of main headings and cross-references and (2) a categorized list of main headings. After each main heading and cross-reference a letter or a letter and a number in parentheses tell in which category or subcategory the main heading is to be found.

2.3.1 Alphabetical List (See Figure 2)

Main Headings --- A main heading is the only authorized term to be used in indexing and cataloging. It is printed in large boldfaced capitals at the left margin.

Cross References --- Cross-references help in determining the most appropriate main heading. Four types of cross-references are provided:

(1) See reference: This indicates that the small boldface term is a synonym of the term to which it refers, the main heading to be used.

(2) See under reference: This indicates that the term being referred to is a more general term than the first term and thus includes the first term as well as other similar terms.

(3) See also related reference: This indicates that the main under which this reference is given is related to another main heading (3) in a different category (or categories), that the two main headings may be on the same level of specificity in concept or that one may be more specific than the other.

(4) See also specific reference: This indicates that the headings related to the main heading are more specific and are included in or are part of that main heading. The more specific concept of a given main heading. The more specific concept of a given main heading is ordinarily indicated in the categorized lists as indented headings.

The See also specific reference serves this purpose in the Alphabetic List. As a rule, they cross categories and subcategories. The Alphabetical List provides another set of cross-references which do not appear in printed Index Medicus or the Cumulated Index Medicus. They are the referred from references and correspond to the see references:

see	X	called	"see from"
see under	XU	"	"see under from"
see also related	XR	"	"see also related from"
see also specific	XS	"	"see also specific from"

2.3.2 Categorized List

All of the main headings in MeSH are categorized into 14 groups which are designed to show relationships between terms. The category to which the heading is assigned is printed in the Alphabetical List in parentheses. The 14 main categories are further subdivided into subcateogories. Figure 3 shows the categorization of 1970 MeSH. Each categorized list contains main headings on two levels of specificity: the basic main heading in all capital letters and the so-called first indention heading in the lower-case letters with the first letter in capital, the latter being more specific than the former. The sample columns in Figure 4 show the physical make-up.

With the exception of the title of the category, each entry in a categorized list is a main heading and therefore can be used for indexing and cataloging. A given main heading may appear two or more times either in the same category indented under a border term or in another pertinent category.

The major use of the cateogorized list is to direct the indexer and searcher to more specific heading pertinent to a given subject. The indentions constitute a tacit cross-reference which corresponds to the see also specific reference in the Alphabetical List. Listing of a given main heading in more than one pertinent categories help to broaden the array of headings related to a given subject from which the most appropriate heading (or headings) can be chosen. The categories display relationships between headings in far greater detail than the cross-references in alphabetical list. Another use of categorized list is to help to define the scope of a heading.

2.4 Updating of MeSH

MeSH is published annually as Part 2 of the January issue of Index Medicus and also with the Cumulated Index Medicus. In addition to this published edition, several computer listings are printed periodically for internal use by indexers and searchers.

MeSH is not a new vocabulary developed specifically for MEDLARS. Rather, it has been developed over the years with the various bibliographical activities of the National Library of Medicine. The content of the vocabulary relates to usage of terms in the actual literature. This means that the vocabulary must be dynamic and flexible enough to meet new concepts and terminology in bio-medical field. A group of professional staff, with the assistance from outside experts in various medical specialities, is in charge keeping MeSH up-to-date. However, the suggestions and advices from the indexers and searchers based on the acutal usage of terms in the literature proved to be more reliable in improving the vocabulary.(2)

Figure 3

MEDICAL SUBJECT HEADINGS
Categories and Subcategories

A Anatomical Terms

A1 Parts of the Body
A2 Musculoskeletal System
A3 Digestive System
A4 Respiratory System
A5 Urogenital System
A6 Endocrine System
A7 Cardiovascular System
A8 Nervous System
A9 Sense Organs
A10 Tissues, Embryonic Structures
A11 Cells and Cell Constituents
A12 Body Fluids and Related Substances
A13 Terminology of Animals

B Organisms

B1 Animal Kingdom - Invertebrates
B2 Animal Kingdom - Vertebrates
B3 Plant Kingdom - Bacteria
B4 Plant Kingdom - Viruses
B5 Plant Kingdom - Fungi, Molds and other Lower Plants
B6 Plant Kingdom - Mosses, Ferns and Higher Plants

C Diseases

C1 Infectious Diseases
C2 Neoplasms, Cysts and Polyps
C3 Musculoskeletal Diseases
C4 Digestive System Diseases
C5 Respiratory Tract Diseases
C6 Urogenital System Diseases
C7 Endocrine Diseases
C8 Cardiovascular Diseases
C9 Hemic and Lymphatic Diseases
C10 Nervous System Diseases
C11 Sense Organ Diseases
C12 Skin Diseases
C13 Diseases of Nutrition and Metabolism
C14 Injury, Poisoning and Immunologic Disease
C15 Diseases Exclusively of Animals
C16 Neonatal Diseases and Abnormalities
C17 Symptoms and General Pathology

D Chemicals and Drugs ....

- D1 Inorganic Chemicals - Elements, Simple Compounds, and Related Terms ....
- D2 Organic Chemicals and Structural Groups ....
- D3 Anti-Infective Agents and Pesticides ....
- D4 Antineoplastic Agents and Immunosuppressive Agents ....
- D5 Autonomic Drugs, Cardiovascular Agents, Muscle Relaxants ....
- D6 CNS Drugs, Antiemetics, Antihistaminics, Antitussive Agents ....
- D7 Hematologic Agents, Gastrointestinal Agents, Agents for Fluid Therapy ....
- D8 Hormones, Precursors, Metabolites, Substitutes and Antagonists ....
- D9 Enzymes, Coenzymes, Enzyme Inhibitors and Precursors ....
- D10 Amino Acids, Peptides, Proteins and Nucleic Acids ....
- D11 Carbohydrates, Lipids, Vitamins and Related Compounds ....
- D12 Immunologic Factors, Biological Factors and Substances ....
- D13 Miscellaneous Chemicals and Drugs ....

E Analytical, Diagnostic and Therapeutic Technics and Equipment ....

- E1 Diagnostic Technics and Equipment ....
- E2 Preventive and Therapeutic Technics and Equipment ....
- E3 Anesthetic Technics and Equipment ....
- E4 Surgical Technics and Equipment ....
- E5 Miscellaneous Technics, Methods and Equipment .....
- E6 Dentistry ....

F Psychistry and Psychology ....

- F1 Psychologic Mechanisms and Processes ....
- F2 Behavioral Symptoms and Mental Disorders ....
- F3 Behavioral Sciences, Psychological Tests, Psychotherapy, Services ....

G Biological Sciences ....

- G1 Biological Sciences and Biological Phenomena ......
- G2 Health Occupations and Disciplines ....
- G3 Environmental Health, Hygiene and Preventive Medicine ....

H Physical Sciences ....

I Anthropology, Education, Sociology and Social Phenomena

J Technology, Commerce and Industry ....

K Humanities ....

L Communication, Library Science and Documentation ......

M Named Groups of Persons ....

N Health Care ....

- N1 Population Characteristics ....
- N2 Health Facilities, Manpower and Services
- N3 Economics, Organizations, Social Control ....
- N4 Health Services Administration ....

Figure 4

A-ANATOMICAL TERMS

A1-Parts of the Body

- ABDOMEN
- BACK
- EXTREMITIES (A2)
- HEAD
- NECK
- PELVIS
- SKIN
- THORAX (A2, A4)

- ABDOMEN
  - Inguinal Canal (A2)
  - Umbilicus
- ANKLE (A2)
- ARM (A2)
  - Axilla
  - Elbow (A2)
  - Forearm
  - Hand (A2)
  - Shoulder (A2)
  - Wrist (A2)
- AXILLA
- BACK
  - Buttocks
  - Lumbosacral Region
  - Sacrococcygeal Region
- BREAST
- BUTTOCKS
- CHEEK
- CHIN
- EAR (A9)
- ELBOW (A2)
- EXTREMITIES (A2)
  - Arm (A2)
  - Leg (A2)
- EYE (A9)
- EYEBROWS (A9)
- EYELASHES (A9)
- EYELIDS (A9)
  - Eyelashes (A9)
- FACE
  - Cheek
  - Chin
  - Eye (A9)
  - Eyebrows (A9)
  - Eyelids (A9)
  - Mouth (A3
  - Nose (A2, A4)
- FINGERS (A2)
  - Thumb (A2)
- FOOT (A2)
  - Heel
  - Toes (A2)
- FOREAM
- HAIR
  - Eyebrows (A9)
  - Eyelashes (A9)
- HALLUX (A2)
- HAND (A2)
  - Fingers (A2)
  - Wrist (A2)
- HEAD
  - Ear (A9)
  - Face
  - Scalp
- HEEL
- HIP (A2)
- INGUINAL CANAL (A2)
- KNEE (A2)
- LEG (A2)
  - Ankle (A2)
  - Foot (A2)
- LEG (A2) (Continued)
  - Hip (A2)
  - Knee (A2)
  - Thigh
- LIP (A3)
- LUMBOSACRAL REGION
- MEDIASTINUM
- MOUTH (A3)
  - Lip (A3)
- NAILS
- NECK
- NOSE (A2, A4)
- PELVIS
- PERINEUM
- SACROCOCCYGEAL REGION
- SCALP
- SEBACEOUS GLANDS
- SHOULDER (A2)
- SKIN
  - Hair
  - Nails
  - Scalp
  - Sebaceous Glands
  - Sweat Glands
- SWEAT GLANDS
- THIGH
- THORAX (A2, A4)
  - Mediastinum
- THUMB (A2)
- TOES (A2)
  - Hallux (A2)
- UMBILICUS
- WRIST (A2)

3. INDEXING

The indexing for MEDLARS is performed by the intellectual effort of human indexer. The operation consists of two parts: descriptive analysis and subject indexing. The former is to provide bibliographic data including journal title abbreviation, name of author, pagination and title of article (translate into English or transliterate if in the language other than English); the latter is to assign the headings from MeSH which best describe the subject content of an article reported by the author.

3.1 Principle

The basic principle of MEDLARS indexing is coordinate indexing; the concepts in the text of articles are expressed by the coordination of two or more indexing terms. Coordination is achieved by

(1) two or more main headings

Ex. Statistics of smoking	SMOKING STATISTICS

(2) a main heading and a subheading

Ex. Metabolism of the liver	LIVER *metabolism

(3) a main heading and a check tag

Ex. Hepatitis in children	HEPATITIS CHILD HUMAN

(4) a pre-coordinated main heading

Ex. LIVER GLYCOGEN from LIVER + GLYCOGEN

These are four types of coordination for MEDLARS indexing. Any article can be indexed by any type of coordination or by the combination of any two or more types.

3.2 Selection of Articles for Indexing

As previously mentioned, MEDLARS data base consists of citations to articles contained in the specified journals. Most journals are indexed dover-to-cover for all original articles and also letters, eidtorials, biographies and obituaries provided they are substantive. Panels, symposia and round-tables are also indexed since they usually have indexable subjects.

3.3 Content Evaluation

An indexer does not merely determine the content of an article and translate in into adequate main headings, but rather he is supposed to bear in his mind what concepts are worth for the users of Index Medicus; what concepts should be stored for possible future use; what type of users will be interested in the article and what part of the particle; whether the content of the article fit into the existing indexing term or requires new term and so forth.

Keeping these points in mind, the indexer examines each article briefly but thoroughly by (1) reading and understanding the title of article; (2) reading the introductory remarks to determine the purpose and sims of the author and their correlation with the title; (3) noting headings of chapter, paragraph or section, charts, plates, tables and illustrations to corroborate further the purpose of the the research; (4) reading the summary or conclusions to determine whether or not the aims are achieved. Then, the indexer assigns the proper subject headings from MeSH to represent what the article is about.

3.4 Selection of Headings

The basic guidelines for the selection of headings for indexing is as follows:

(1) Index each concept completely

(2) Index under the most specific heading available for each concept to be covered; do not index the same concept under both a specific and a general heading.

(3) Index concepts which have no exact equivalent in MeSH but which are closely related to an existing heading, e.g. "pre-", "post-" and "pseudo-", under the MeSH term.

(4) Index negative findings on any concept -- organ, disease, organism, physiological process, drugs -- under the Mesh concept.

3.5 Index Medicus Headings (IM) and Mon-Index Medicus Headings (NIM)

The multi-purposes of MEDLARS, namely the production of printed Index Medicus and preparation of demand search service, are reflected in the indexing operation in a twofold approach: headings to be printed in the monthly and cumulated Index Medicus; and the headings to be stored for future retrieval for the recurring and demand bibliographies. The headings for printing in Index Medicus are referred to as IM (Index Medicus) headings and those for storing are referred to as NIM (Non-Index Medicus) headings.

All headings assigned to each article must be evaluated according to the general criteria; those headings which best reflect the major content of the article are selected as IM headings, and those which are subsidiary to the major concepts are made as NIM for future retrieval. All headings, both IM and NIM headings are stored in the computer for future retrieval.

3.6 Data Form

Indexing is practiced by using Data Form, a work sheet. A sample Data Form is appended. The indexer is required to complete the Data Form from the article in hand by providing descriptive data which constitute the citation, and subject data with appropriate headings and Check Tags to describe the content of the article.

Descriptive data include: (1) JTA (journal title abbreviation) followed by volume, issue number and date of publication; (2) pagination; (3) author's name; and (4) title (translated into English or transliterated if in the language other than English).

A special mention should be made of Check Tags. They are the concepts which must be routinely accounted for every article indexed, therefore, pre-printed on the Data Form. They consist of (1) Pregnancy, (2) Age groups, (3) Experimental animals, (4) History of medicine and chronological tags, and (5) miscellaneous group of tags describing the type of study. Some check tags are themselves subject headings of MeSH while others are represented only on the Data Form. Some check tags are always NIM as so specified on the Data Form; others may be either IM or NIM depending upon the concept in the article and also on the indexing policy.

Review with the specification of the number of references and English abstract, strictly speaking not check tags, which are included on the Data Form for routine checking.

3.7 Subheadings

As previously mentioned, one of the four types of coordination in MEDLARS indexing is a main heading - subheading combination. Subheadings bring out a specific aspect of a subject represented by a main heading, e.g. given a subject of a drug, author may be discussing its metabolism, or therapeutic use in certain disease, or safety dose, or any other aspects. Each aspect is represented by the subheadings *metabolism, *pharmacodynamics, *therapeutic use, and *toxicity respectively.

The basic policy on use of subheadings is that each subheading is permitted to be combined only with main headings in specified categories. Alphabetical letters in parenthesis appearing after each subheading in the attached list designates the categories of main headings to which it can be combined. Definition is given of each subheading in the published MeSH and Cumulated Index Medicus. Sound common sense is also expected in the use of subheadings even within the limitation of permissible categories, e.g. DOGS *cytology is indiscreet while INSECTS *cytology is quite correct. Figure 5 lists 60 subheadings in use for 1970.

INDEX MEDICUS SUBHEADINGS - 1970

Alphabetical List of 60 Subheadings

*abnormalities (A)
*administration & dosage (D)
*adverse effects (D,E,H,J)
*analysis (A,B,D,G,J)
*anatomy & histology (A,B)
*antagonists & inhibitors (D)
*biosynthesis (D)
*blood (C,D,F)
*blood supply (A)
*cerebrospinal fluid (C,D,F)
*chemical synthesis (D)
*chemically induced (C,F)
*classification (B,C,D,E,F,G,H,I,N)
*complications (C,F)
*congenital (C)
*cytology (A,B)
*diagnosis (C,F)
*diagnostic use (D,H)
*drug effects (A,B,F,G)
*drug therapy (C,F)
*education (F,G,H,I,N)
*embryology (A,B,C)
*enzymology (A,B,C,F)
*etiology (C,F)
*familial & genetic (C,F)
*growth & development (A,B)
*history (C,D,E,F,G,H,I,J,K,L,M,N)
*immunology (A,B,C,F)
*injuries (A)
*innervation (A)
*instrumentation (E,F,G,H,J)
*isolation & purification (B,D)
**manpower (E,F,G,H,I,L,N)
*metabolism (A,B,C,D,F)
*microbiology (A,C)
*mortality (C,E,F)
*nursing (C,E,F)
*occurrence (C,F)
*pathogenicity (B)
*pathology (A,C,F)
*pharmacodynamics (D)
*physiology (A,B,D)
*physiopathology (A,C,F)
*poisoning (D,J)
*prevention & control (C,F,G)
*radiation effects (A,B,D,G)
*radiography (A,C,F)
*radiotherapy (C,F)
*rehabilitation (C,F)
*secretion (A,D)
*standards (D,E,F,H,I,J,L,N)
*supply & distribution (D,E,L,N)
*surgery (A,C,F)
*therapeutic use (D,H)
*therapy (C,F)
*toxicity (D,J)
*transplantation (A)
*urine (C,D,F)
*utilization (E,L,N)
*veterinary (C,E)

4. SEARCHING

MEDLARS demand search is conducted to meet the information needs of an individual requester. If a preliminary literature search in Index Medicus and other published bibliographies fails to provide needed information, a demand search service may meet specific information needs.

4.1 Restrictions and Limitations

There are some restrictions on the use of demand search service as well as various types of information which MEDLARS is not designed to provide. They include:

(1) Total file search. The MEDLARS file dates back to mid-1963, the search of the file is currently limited as far back as to January 1967.

(2) Author searches. The MEDLARS is not designed to search on author's names. For this purpose, author indexes are available in Index Medicus and Cumulated Index Medicus.

(3) Verification of specific citations. This can be satisfied in Index Medicus.

(4) Search on a single subject, or concepts which can easily be coordinated, e.g., breast cancer, anemia in pregnancy. The citations are found in Index Medicus under the appropriate headings such as BREAST NEOPLASMS and PREGNANCY COMPLICATIONS, HEMATOLOGIC.

(5) Data or factual information.

(6) Subject matter not in scope of MEDLARS.

4.2 Request Analysis

Requests for demand search should be submitted on MEDLARS Search Request Forms, which are available from local medical libraries and MEDLARS stations in the United States, and various parts of the world as well. There are eleven MEDLARS stations currently operating in the U.S. (at UCLA, Harvard, Ohio State University, Universities of Colorado, Alabama, Michigan and Texas, Washington University, etc.). See Figure 6) The oversea centers include British MEDLARS Center at the National Lending Library for Science and Technology, Scandinavian Center at the Karolinska Institutet in Sweden, French Center at Institut National de la Sante et de la Recherche Medicale, and Australian Center at the National Library of Australia.

It is important to make search request in a clear and concise statement in order to obtain a bibliography as relevent and comprehensive as possible. A sample Request Form is attached. In submitting a search request, the user is asked to present a detailed and specific statement of requirements, to cite pertinent citations that he may know of, to estimate the number of citations he would expect to receive, and to state any restrictions to be placed on the search. He also indicates which languages he wants to be included in the search and whether the final bibliography should be printed on 81/2 x 11 paper or on 3 x 5 cards. (See Figure 7)

The searcher analyzes and clarifies the request and builds search formulation, which is used as the basis for computer matching and retrieval. The formulation consists of two major parts:

a list of the search elements to be used, and from one to three search equations representing the logical relationship between elements in the search. The main elements used in searching are terms from the master MeSH. In addition, however, other search elements such as author names, journal titles and year of publication may also be used when necessary. The following table shows the search elements with indication of their symbols.

Element symbol	Name
M	Main heading
S	Subheading
G	Geographic heading
F	Form heading (e.g., Review article)
T	Main heading used only as "Print" heading for Index Medicus
Z	Main heading used as non-Index Medicus heading
C	Category number from MESH hierarchy
A	Author name
J	Journal title code
I	Computer entry date
L	Language abbreviation
Q	Place of publication
Y	Year of publication
X	Main heading/subheading combination

In formulating search statement, the searchers use in addition to alphabetical MeSH a version of MeSH called "tree structure" in which MeSH main headings are arranged in four-level hierarchy. This tool is particularly useful for "explosion" by using the symbol "E" after the term and designating the number of levels in the Tree Structure to which the term is to be expanded. The computer searches not only for the stated term, but also for other terms specific to it in the hierarchy. Another feature of MEDLARS search formulation is "hedges", which group together cross-categorically a collection of terms identifying a concept required in the search.

The searcher first lists and groups the search elements, and then prepares from one to three search statements. Individual elements and sums of elements are linked together into a search equation by use of three operators: OR (+); AND (*); NOT (-). For the computer entry date and year of publication, GREATER THAN OR EQUAL TO (=) and LESS THAN OR EQUAL TO (=) are used. The searcher is provided with the option of formulating subsearches for simulataneous expression of as many as three levels of increasing specificity, which are referred to as Sections 4, 5 and 6. The first statement may be a broad expression of needed information; the second may introduce certain limitations; and the third may impose the greatest specificity for the query. Specimen form illustrates demand search formulation record. When the search formulation is completed, the format for printing citations in the final bibliography (paper or card) and the sequence of arranging citations (alphabetical by author names; alphabetical by journal title abbreviation, etc.) have to be decided and recorded on a Report Generator Request Form. A sample copy is attached.. A title to the search including those for subsearches are also recorded on the Form.

The Search Formulation Record and Report Generator Request Form are then forwarded to input for the computer in machine-readable form.

REFERENCES

(1) MEDLARS/NETWORK Technical Bulletin, no. 4, August 1969, p. 9.

(2) Lancaster, F.W. Evaluation of the MEDLARS demand search sergice. NLM, Bethesda, Maryland, 1968.

Sample

REQUEST NO. 070852

DEMAND SEARCH FORMULATION RECORD

DATE March 15, 1968

TITLE Molluscum Contagiosum.

11-14 ELEM. SYMBOL	17 EXPL.	18 LEVEL	19-31 CATEGORY NUMBER	ELEMENTS	TALLY	11-14 ELEM. SYMBOL	17 EXPL.	18 LEVEL	19-31 CATEGORY NUMBER	ELEMENTS	TALLY
M1				Molluscum Contagiosum							
M2				Molluscum Contagiosum Virus							
M5				Clinical Research							
M6				Epidemiology							
M7	E			Immunity							
M8				Immunology							
M9				Venereal Diseases							
S1				etiology							
S2				immunology							
S3				occurrence							
S4				pathogenicity							

ELEMENTS A, ⊥ I, N, Y, X, AND SUMMATIONS

SECT. 7 3-	ELEM. SYMBOL 11-14	33-36	37-40	41-44	45-48	49-56	7 3-	11-14	33-36	37-40	41-44	45-48	49-56
	M25	SUM	M1	M2									
	M30	SUM	M5	M9									
	S5	SUM	S1	S4									

REQUEST STATEMENTS

SECT. 7	ELEM. SYMBOL 9-10	11-80 COLUMNS	FOUND
4	01	M25.	
5	01	M30 + S5.	
6	01	M9.	

BATCH NO.	DS MODULE	COMMENTS	RG MODULE	COMMENTS

PHS-4667-2 (4-67)

Sample
REPORT GENERATOR REQUEST FORM

Request Number	Form Identifier	No. of citations	Output media	Tracings	Sort Keys	Headings					No. of cols.	Citation Arrangement NJ			Column Widths NJ			Page Number	Name Sectic Page Number
						M T Z	G	H	P	Y		Col 1	Col 2	Col 3	Col 1	Col 2	Col 3		
RJ 1-6	7-8	RJ 10-14	15	16	LJ 17-24	25	26	27	28	29	40	41-44	45-47	48-49	51-52	53-54	55-56	LR 58-62	LR 65-69
070852	F 1	ALL	C	X	SA														

Request Number 1-6	Card Identifier 7-8	First Page Title - First Line 9-80
070852	H1	Molluscum contagiosum. 6-Venereal disease. 5-Etiology.

Request Number 1-6	Card Identifier 7-8	First Page Title - Second Line 9-80
070852	H2	4-Other aspects.

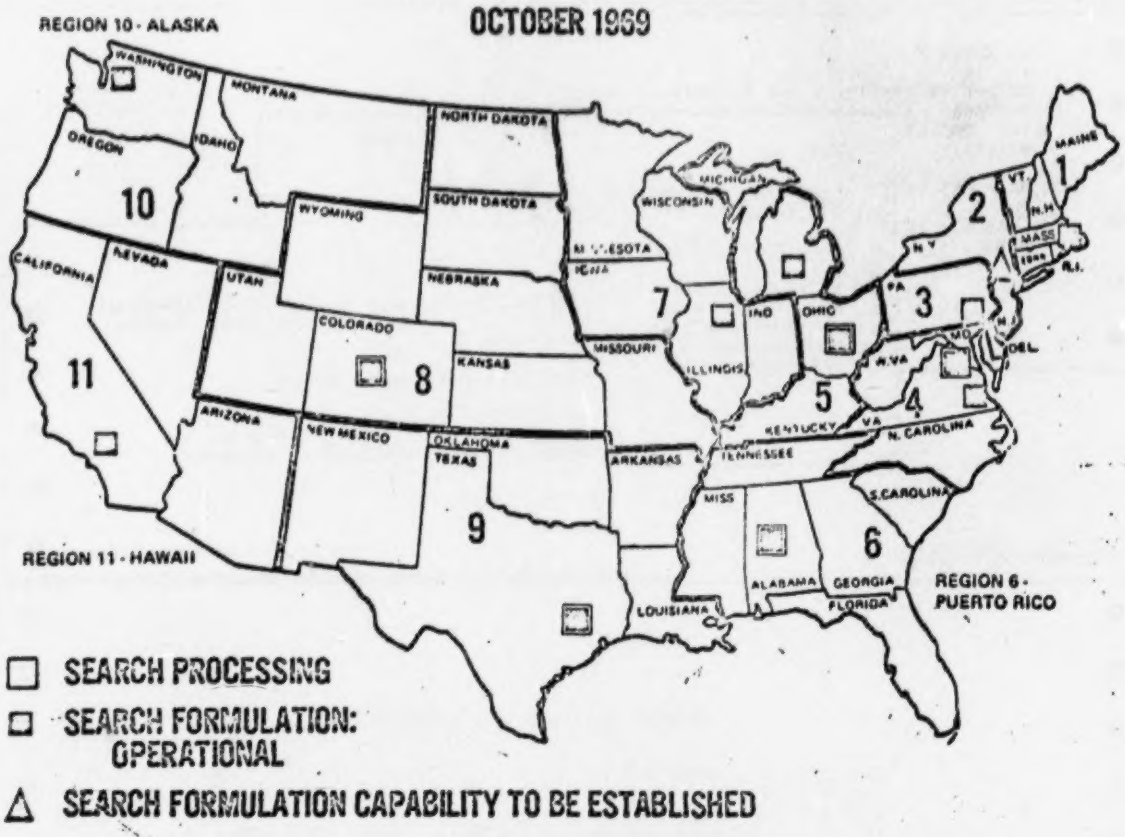
Request Number 1-6	Card Identifier 7-8	First Page Title - Third Line 9-80
	H3	

Request Number	Card Identifier	Column 1 Heading/Column 2 Heading/Column 3 Heading
	S	

Figure 6

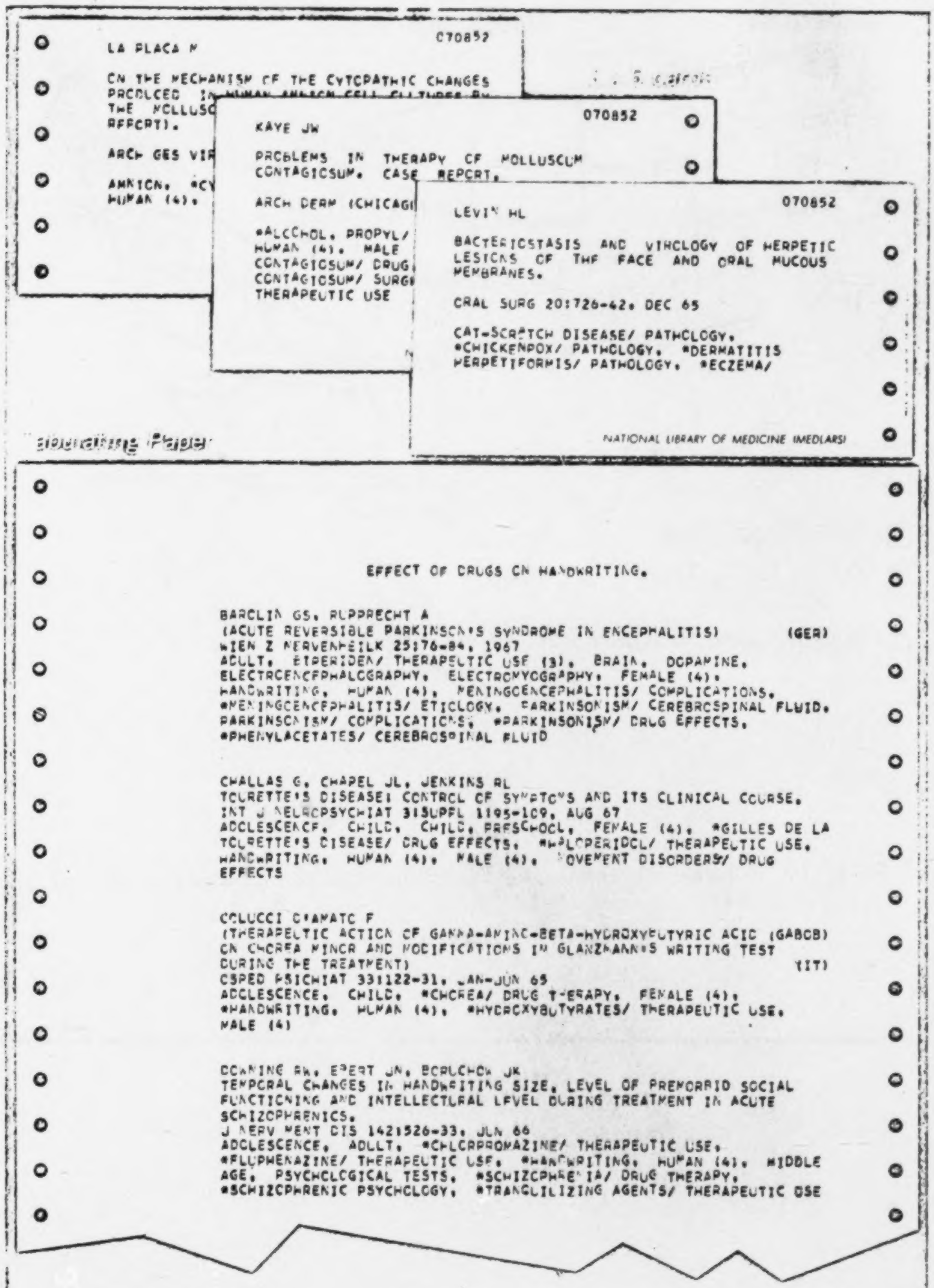
MEDLARS STATIONS *

OCTOBER 1969


REGION 10 - ALASKA
WASHINGTON
MONTANA
NORTH DAKOTA
OREGON
IDAHO
10
WYOMING
SOUTH DAKOTA
MINNESOTA
WISCONSIN
MICHIGAN
MAINE
1
2
VT
N.H.
N.Y.
MASS
CONN
R.I.
CALIFORNIA
NEVADA
UTAH
NEBRASKA
IOWA
7
PA
3
COLORADO
8
KANSAS
MISSOURI
ILLINOIS
IND
OHIO
N.J.
MD
DEL
11
W.VA
5
4
VA
KENTUCKY
N. CAROLINA
ARIZONA
NEW MEXICO
OKLAHOMA
TEXAS
ARKANSAS
TENNESSEE
S.CAROLINA
9
MISS
ALABAMA
GEORGIA
6
REGION 11 - HAWAII
LOUISIANA
FLORIDA
REGION 6 - PUERTO RICO
☐ SEARCH PROCESSING
☐ SEARCH FORMULATION: OPERATIONAL
△ SEARCH FORMULATION CAPABILITY TO BE ESTABLISHED

* Guide to MEDLARS Services. National Library of Medicine, 1969, p. 11.

Figure 7



LA PLACA M

070852

ON THE MECHANISM OF THE CYTOPATHIC CHANGES
PRODUCED IN
THE MOLLUSC
REPORT).

ARCH GES VIR

AMNION, *CY
HUMAN (4).

KAYE JW

070852

PROBLEMS IN THERAPY OF MOLLUSCUM
CONTAGIOSUM. CASE REPORT.

ARCH DERM (CHICAGO

*ALCOHOL, PROPYL/
HUMAN (4). MALE
CONTAGIOSUM/ DRUG
CONTAGIOSUM/ SURGE
THERAPEUTIC USE

LEVIN HL

070852

BACTERIOSTASIS AND VIROLOGY OF HERPETIC
LESIONS OF THE FACE AND ORAL MUCOUS
MEMBRANES.

ORAL SURG 20:726-42, DEC 65

CAT-SCRATCH DISEASE/ PATHOLOGY.
*CHICKENPOX/ PATHOLOGY. *DERMATITIS
HERPETIFORMIS/ PATHOLOGY. *ECZEMA/

NATIONAL LIBRARY OF MEDICINE (MEDLARS)

EFFECT OF DRUGS ON HANDWRITING.

BARCLIN GS, RUPPRECHT A
(ACUTE REVERSIBLE PARKINSON'S SYNDROME IN ENCEPHALITIS) (GER)
WIEN Z NERVENHEILK 25:76-84, 1967
ADULT, BIPERIDEN/ THERAPEUTIC USE (3), BRAIN, DOPAMINE,
ELECTROENCEPHALOGRAPHY, ELECTROMYOGRAPHY, FEMALE (4),
HANDWRITING, HUMAN (4), MENINGOENCEPHALITIS/ COMPLICATIONS,
*MENINGOENCEPHALITIS/ ETIOLOGY, PARKINSONISM/ CEREBROSPINAL FLUID,
PARKINSONISM/ COMPLICATIONS, *PARKINSONISM/ DRUG EFFECTS,
*PHENYLACETATES/ CEREBROSPINAL FLUID

CHALLAS G, CHAPEL JL, JENKINS RL
TOURETTE'S DISEASE: CONTROL OF SYMPTOMS AND ITS CLINICAL COURSE.
INT J NEUROPSYCHIAT 3:SUPPL 1:95-109, AUG 67
ADOLESCENCE, CHILD, CHILD, PRESCHOOL, FEMALE (4), *GILLES DE LA
TOURETTE'S DISEASE/ DRUG EFFECTS, *HALOPERIDOL/ THERAPEUTIC USE,
HANDWRITING, HUMAN (4), MALE (4), MOVEMENT DISORDERS/ DRUG
EFFECTS

COLUCCI D'AMATO F
(THERAPEUTIC ACTION OF GAMMA-AMINO-BETA-HYDROXYBUTYRIC ACID (GABOB)
ON CHOREA MINOR AND MODIFICATIONS IN GLANZMANN'S WRITING TEST
DURING THE TREATMENT) (IT)
OSPED PSICHIAT 33:122-31, JAN-JUN 65
ADOLESCENCE, CHILD, *CHOREA/ DRUG THERAPY, FEMALE (4),
*HANDWRITING, HUMAN (4), *HYDROXYBUTYRATES/ THERAPEUTIC USE,
MALE (4)

DOWNING RW, EBERT JN, BORUCHOW JK
TEMPORAL CHANGES IN HANDWRITING SIZE, LEVEL OF PREMORBID SOCIAL
FUNCTIONING AND INTELLECTUAL LEVEL DURING TREATMENT IN ACUTE
SCHIZOPHRENICS.
J NERV MENT DIS 142:526-33, JUN 66
ADOLESCENCE, ADULT, *CHLORPROMAZINE/ THERAPEUTIC USE,
*FLUPHENAZINE/ THERAPEUTIC USE, *HANDWRITING, HUMAN (4), MIDDLE
AGE, PSYCHOLOGICAL TESTS, *SCHIZOPHRENIA/ DRUG THERAPY,
*SCHIZOPHRENIC PSYCHOLOGY, *TRANQUILIZING AGENTS/ THERAPEUTIC USE

Sample Request Form DOCTEC/LEC/11

NATIONAL LIBRARY OF MEDICINE
MEDLARS MANAGEMENT SECTION
8600 Rockville Pike
Bethesda, Maryland 20014

MEDLARS SEARCH REQUEST

DATE

Is this your first request to MEDLARS?

☐ YES ☐ NO

1. INDIVIDUAL WHO WILL ACTUALLY USE THIS BIBLIOGRAPHY
First Middle Last Name

TELEPHONE NO.

2. TITLE

3. ORGANIZATION *(Department, Bureau, Branch, Division, etc.)*

4. ORGANIZATION *(University, Corporation, Company, etc.)*

5. STREET ADDRESS AND CITY

6. STATE AND ZIP CODE

7. REQUEST SUBMITTED BY *(If different from above)*

TELEPHONE NO.

8. SEARCH ANALYST *(Leave Blank)*

ALL OF THE QUESTIONS THAT FOLLOW ARE DESIGNED TO PROVIDE INFORMATION NEEDED TO DEVELOP A BIBLIOGRAPHY THAT IS RESPONSIVE TO YOUR NEEDS. YOUR CARE IN PROVIDING FULL INFORMATION WILL AFFECT THE USEFULNESS OF THE CITATIONS THAT YOU WILL RECEIVE.

9. DETAILED STATEMENT OF REQUIREMENTS: Please describe, in your own words, the subject matter for which the search is to be conducted. Be as specific as possible. Define any terms that may have special meaning in your request. Also if there are points NOT to be included, please state these.

NIH-1393-1
(Rev. 1-69)

10. **SEARCH PURPOSE:** Please indicate the purpose for which this search will be used (e.g., preparation of a book, book chapter, journal article, or review article; for immediate clinical application; ongoing research; prospective research; grant application; paper presented at symposium, etc.). Give specific details that will put your request into context.

11. **SEARCH LIMITATIONS:** Please check all boxes that are appropriate to the scope of your request. State your needs as specifically as possible, even though we may not be able to meet these precise needs in some cases. Your replies will allow the search analyst to design a strategy that, as far as possible, will avoid types of literature that are of no interest to you.

☐ NO RESTRICTIONS

☐ HUMAN SUBJECTS

☐ VETERINARY MEDICINE: If only certain animals or animal groups are of interest, please list these:

☐ ANIMAL EXPERIMENTS: If only certain animals or animal groups are of interest, please list these:

☐ MALE

☐ NORMAL STATE

☐ DISEASED STATE

☐ FEMALE

☐ CLINICAL RESEARCH *(testing of drugs or technics in humans only)*

☐ IN VITRO STUDIES *(of animal or human tissues or fluids only)*

☐ CASE HISTORIES

LANGUAGE RESTRICTIONS:

☐ ACCEPT ALL LANGUAGES

☐ ACCEPT ONLY ENGLISH

☐ ACCEPT CERTAIN LANGUAGES ONLY *(please specify)*

AGE GROUPS: If only certain age groups are of interest, please indicate which ones:

GEOGRAPHIC RESTRICTIONS: If only certain regions are of interest, please list these:

NIH-1393-1
(Rev. 1-69)

12. KNOWN RELEVANT PAPERS: Please carry out a preliminary literature search of your own before submitting this request to MEDLARS, and supply full bibliographic citations below for relevant articles you have found. Wherever possible, they should be journal articles published since January 1966. These citations will be used as a guide in retrieving similar citations related to your needs. They will also be used in a later appraisal of the results of this search. If no relevant papers have been found, please state "none found".

a.

b.

c.

d.

e.

If you used INDEX MEDICUS for your preliminary search please list the subject headings under which you sought citations:

13. SEARCH REQUIREMENTS: Please check one of the boxes below to indicate the type of search that you would prefer:

☐ A broad search designed to retrieve as many as possible of the relevant citations, but which might also retrieve many irrelevant citations.

☐ A narrow search designed to retrieve some only of the relevant citations, but with few accompanying irrelevant citations.

NUMBER OF CITATIONS EXPECTED: Please check the appropriate box to indicate the number of journal articles dealing with the subject of your request that you consider likely to have been published since January 1966.

☐ 0

☐ 1 - 9

☐ 10 - 50

☐ 51 - 100

☐ 101 - 200

☐ 201 - 500

☐ OVER 500

14. PRINT ON:

☐ 3" × 5" cards or ☐ 8½" × 11" paper

Fold on dashed line

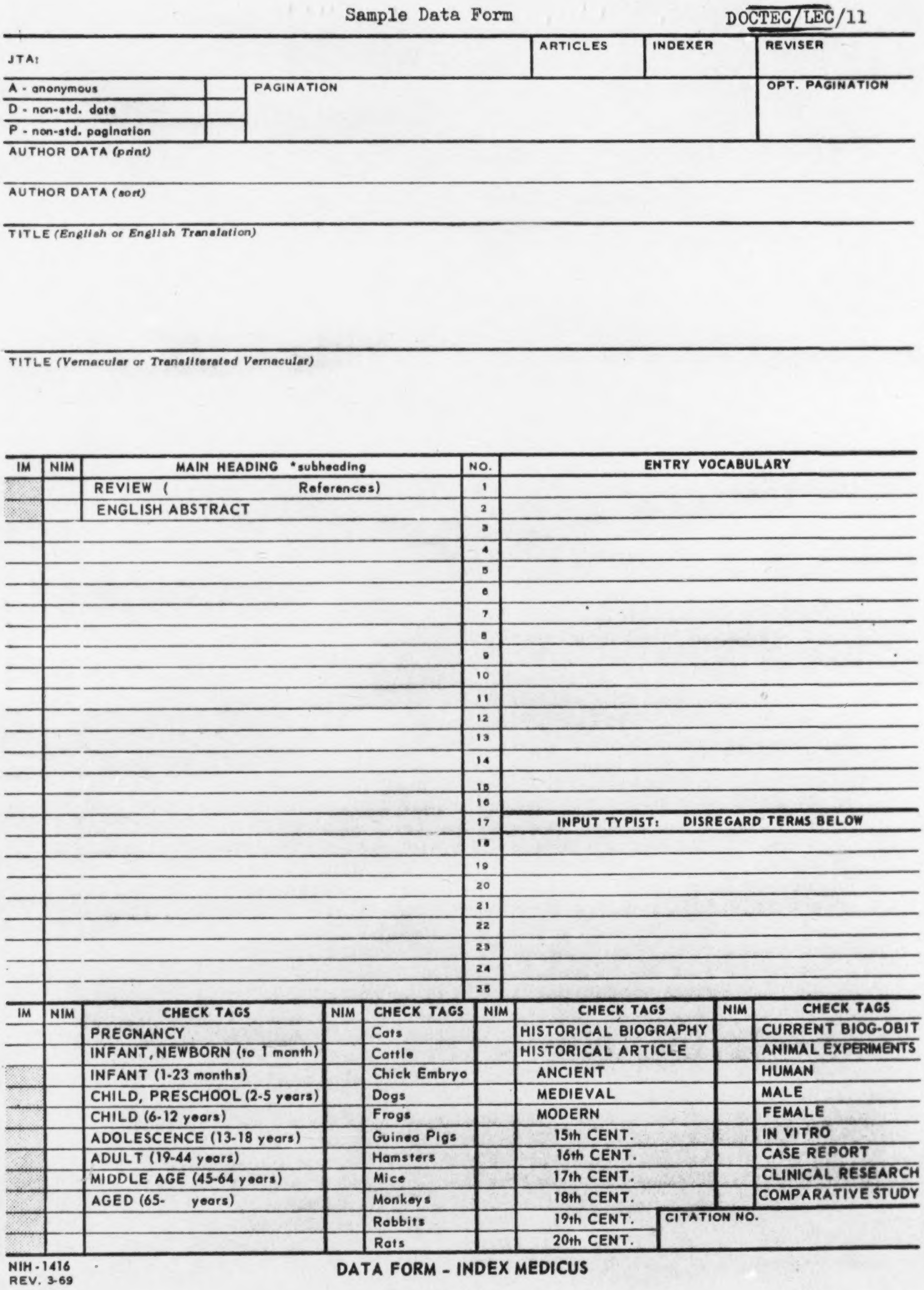
FROM:

Place
Stamp
Here

Mid-Atlantic Regional Medical Library
P.O. Box 30260
Bethesda, Maryland 20014

Staple here to close

Sample Data Form DOCTEC/LEC/11



JTA:	ARTICLES	INDEXER	REVISER

A - anonymous		PAGINATION	OPT. PAGINATION
D - non-std. date			
P - non-std. pagination			

AUTHOR DATA *(print)*

AUTHOR DATA *(sort)*

TITLE *(English or English Translation)*

TITLE *(Vernacular or Transliterated Vernacular)*

IM	NIM	MAIN HEADING *subheading	NO.	ENTRY VOCABULARY
▨		REVIEW (References)	1	
▨		ENGLISH ABSTRACT	2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
			16	
			17	INPUT TYPIST: DISREGARD TERMS BELOW
			18	
			19	
			20	
			21	
			22	
			23	
			24	
			25	

IM	NIM	CHECK TAGS	NIM	CHECK TAGS	NIM	CHECK TAGS	NIM	CHECK TAGS
		PREGNANCY		Cats		HISTORICAL BIOGRAPHY		CURRENT BIOG-OBIT
		INFANT, NEWBORN (to 1 month)		Cattle		HISTORICAL ARTICLE		ANIMAL EXPERIMENTS
▨		INFANT (1-23 months)		Chick Embryo		ANCIENT		HUMAN
▨		CHILD, PRESCHOOL (2-5 years)		Dogs		MEDIEVAL		MALE
▨		CHILD (6-12 years)		Frogs		MODERN		FEMALE
▨		ADOLESCENCE (13-18 years)		Guinea Pigs		15th CENT.		IN VITRO
▨		ADULT (19-44 years)		Hamsters		16th CENT.		CASE REPORT
▨		MIDDLE AGE (45-64 years)		Mice		17th CENT.		CLINICAL RESEARCH
▨		AGED (65- years)		Monkeys		18th CENT.		COMPARATIVE STUDY
▨				Rabbits		19th CENT.	CITATION NO.	
▨				Rats		20th CENT.		

NIH-1416
REV. 3-69

DATA FORM - INDEX MEDICUS

Distribution: limited

DOCTEC/LEC/12
Tokyo, 3 August 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

INDEX MEDICUS AND EXCERPTA MEDICA

Yoshinari Tsuda

"Index Medicus" and "Excerpta Medica" are two major publications used for literature search in medicine. The former is an indexing service, latter an abstracting service. And both of them claim to cover all the important medical periodical articles of the world.

"Index Medicus"

"Index Medicus" superseded the "Current List of Medical Literature" in 1960, is prepared by the National Library of Medicine in Bethesda, Maryland, U.S.A.

The library has been playing a major role in medical documentation of the world ever since it began to publish "Index-Catalogue of the Library of the Surgeon General's Office, U.S.Army", in 1880 when the library was called by the name.

The old series of "Index Medicus" was begun to publish in 1879 as a monthly supplement to the "Index-Catalogue".

This "Index Medicus" continued through 1926 except for three years, from 1900 to 1903. Then, it was amalgamated with the "Quarterly Cumulative Index to Current Medical Literature" which was published by the American Medical Association (AMA). The two indexes were merged in 1927 and became to be the "Quarterly Cumulative Index Medicus" (QCIM). This new index was published by the AMA but was jointly sponsored by the AMA and the National Library of Medicine, then, it was called as the Army Medical Library.

The library began to publish a new publication in 1941 which was a kind of current contents service to be used in connection with the library's photo-duplication service, and was titled "Current List of Medical Literature".

During the World War II, the "QCIM" fell behind because of difficulty to obtain foreign journals, personnel shortages, and the printer's strikes. This made it necessary for the library to expand the coverage of the "Current List" to the size of a grand scale indexing service.

The "QCIM" and the "Current List" were published concurrently until 1959. Duplication between these two occurred, but even together they were deficient in listing the total substantive medical literature.

Early in 1959 the AMA was invited by the library to amalgamate the "QCIM" with the "Current List of Medical Literature" and to publish jointly the new "Index Medicus" so that they could cope with the continuing increase of the world medical literature better.

The "QCIM" ceased publication in 1959 with volume 60, July-December 1956. Therefore the only comprehensive indexing tool to be used for searching medical periodical literature of 1957-1959, is the "Current List".

"Index Medicus" now is compiled and printed by MEDLARS, a computer based literature search system developed by the Nation Library of Medicine. It indexes now more than 200,000 articles from about 2,200 medical journals of the world in a year.

Deciding which journal to be included in an index is not an easy task and no indexing nor abstracting journal can escape the dilemma of choosing either completeness or selectivity.

"Index Medicus" is supposed to cover most of the important medical periodicals of the world. However, judging from Japanese titles included in the index, we can not help but doubting the ability of the Library in evaluating the quality of the literature written in a language unfamilial to the doctors and medical librarians in the United States. For instance, there are more than 1,200 medical journals published in Japan of which 128 titles are now included in the list of journals indexed for "Index Medicus". Although many of these Japanese journals not indexed in the Index may not be important enough to be included in this expensive, international bibliographic tools, there are quite a number of journals which would be prefered by Japanese doctors to some of the journals already included in the Index.

Karel's article1) on the subject of journal selection for the Index explains the difficulty of the task. Even when a journal is chosen for inclusion, not all of the articles in this particular journal are indexed.

"Index Medicus" has the following policy2) for the selection of articles for indexing.

1) Index all original articles on medical and biomedical subject regardless of form or length.

2) Index all substantive biographies and obituaries.

3) Index all clinico-pathological conferences.

4) Index reports of scientific material presented at congresses and conferences regardless of length. Do not index reports of congress and conferences concerning committee matters, organizational details, financial reports, etc. Do not index articles in which an author summarizes and comments on what took place at a congress or meeting, much as a newspaper report might do.

5) Index so-called "editorials" which are in fact lead articles or special articles on substantive material, generally supplied with a bibliography. Do not index editorials which resemble the newspaper concept of editorial with possibly only local interest.

6) Index letters to the editor which are substantive and which are documented and which in fact constitute an "article".

7) Index all letters to the editor, regardless of length, which report on the side-effects of drugs or chemicals.

8) Index all reports of Councils of the American Medical Association.

9) Index all directories and membership lists.

10) Index all brief articles and short communications in such journals as Nature, Science and the like, which are on medical and biomedical subjects, despite their brevity.

11) Index questions-and-answers if the answer constitutes a little "article" and is substantive and documented.

12) Index panels, symposia and round-tables, formal and informal, since they are usually on a finite topic and indexable from a subject standpoint.

13) Index formal discussions of articles (a formal discussion is one with a title more distinctive than the designation "Discussion" and with authors indicated formally).

As easily be understood from the above mentioned policy, the selection of articles for "Index Medicus" from a journal is fairly comprehensive.

The index itself is published monthly, then cumulated into the annual "Cumulated Index Medicus".

Each issue is in two main parts -- a name section, arranged by author with titles of articles in their original languages with some exception like in Japanese which is translated into English; and a subject section, arranged by subject headings, with the titles of all articles given in English.

The index is a fairly well designed index and it would be no more difficult to use than any other large index, if it included in the subject sections a more generous number of see and see also cross references. The worst part is the monthly issues which include no reference at all. The annual cumulated issues include some kinds of subject cross references but not the kind which directs its users from a general heading such as Hernia to the more specific headings such as Diaphragmatic Hernia, Femoral Hernia and so on which are also used in the index.

And if an user miss finding these more specific headings, he will miss the reference they cover, because an article on Diaphragmatic Hernia will not also be listed under the general term Hernia.

To be able to use "Index Medicus" fully with the help of all the cross references, the user of the index should be familiarized himself with the arrangement and the constraction of the Medical Subject Headings (MeSH).

MeSH is the authorized list of subjects under which medical articles from journals to be indexed will be entered and searched under the MEDLARS programme or in "Index Medicus". It is revised annually and published each January as Part 2 of "Index Medicus".

In medicine, like in other large fields of knowledge, because of its age, scope and complexity, there is a great number of synonyms and overlapping terms.

MeSH is an attempt to select from the vast terminology, one term under which all literature on the same subject may be grouped and indexed. MeSH, therefore, excludes many alternate terms in giving preference to one.

The cross reference directs the user from a term not used in the index to another which are included in the index. The following are examples from the "Cumulated Index Medicus".

MENTAL TESTS see INTELLIGENCE TESTS

This means that MENTAL TESTS is a synonym for the main heading INTELLIGENCE TESTS used in the index and INTELLIGENCE TESTS instead is the heading to be used for articles on mental tests.

MELON see under FRUITS

This indicates that FRUITS, the term being refered to, is a more general term as well as other similar terms, and that material on MELON will be found among the entries under FRUITS because it is a derivative of fruit.

BLOOD (A7, A10, A12)	see also related	ACID-BASE EQUILIBRIUM (G1, H)

This indicates that this main heading BLOOD is related to another main heading ACID-BASE EQUILIBRIUM in a different category; that the two main headings may be on the same level of specificity or that one may be more specific than the other.

PANCREATIC JUICE see also specific CHYMOTRYPSIN, RENNIN, TRYPSIN

This indicates that the headings, CHYMOTRYPSIN, RENNIN and TRYPSIN related to the main heading, PANCREATIC JUICE are more specific and are contained in or are a part of that main heading.

MeSH is divided into two parts: (1) an alphabetical list of main headings and cross-reference and (2) a categorized list of main headings. Right now there are around 7,000 main headings, about 8,000 cross-references and 13 categories with a number of subcategories under some of these main categories.

Ordinarily specific aspects of a given main headings show up in the categorized lists as indented headings. For instances;

ANTIBIOTICS
  PENICILLIN
  RIFOMYCIN
    etc.

Besides the main headings, the index uses a number of subheadings which afford a convenient means of grouping togather constantly recurring aspects of specific subject. Literature under various subjects appears to fall into large, natural groups. In articles about organs, their anatomy, their physiology, their diseases, their pathology, etc. are often discussed. In articles about diseases, authors often mention about their etiology, their physio pathology, their epidemiology, their therapy. In articles about drugs, their metabolism, their pharmacology, their therapeutic use, etc. are frequently mentioned.

Under a main heading in the index, subheading will always answer the question, "What aspect of this main heading is the author of the article writing about?" Therefore, in searching literature by using the "Index Medicus" one has to be well acquainted with these subheadings to be able to obtain the information sought quickly and correctly.

"Recurring Bibliographies"

There are two definitely distinctive trends in the world indexing and abstracting services today. One is the utilization of computers in compiling and printing these secondary tools and even transforming these services to the computer-based information service system. The other is the tendency of producing new services in so-called mission oriented fields as air pollution, water pollution, transportation, industrial waste, adverse effects of drugs, etc.

MEDLARS, a computer based medical literature search system is not only producing the printed "Index Medicus", but also putting out many of the specialized indexes which are called "recurring bibliographies."

"Cerebrovascular Bibliography", Including Neurological, Vascular, Hematological Aspects", "Rheumatology Bibliography", "Fibrinolysis and Blood Coagulation Bibliography", "Index to Dental Literature", "International Nursing Index", "Diabetes-related Index", "Gastroenterology Abstracts and Citations", "Bibliography of Medical Education", etc. are the recurring bibliographies covering various specific fields in medicine.

To search the literature in these fields, these indexes will give use more detailed information than "Index Medicus" which covers medical fields in general. However, the indexing terms used in these special tools are also based on MeSH and therefore easily be used by the person familial with its terminology.

"Excerpta Medica"

During the World War II, all of German "Zentralblastts", famous abstracting services, vanished. To fill in the gap made by this situation, two abstracting services aiming to cover all the medical fields appeared simultaneously in 1947. One of them was this "Excerpta Medica", published by a non-profit foundation in Amsterdam, Netherlands, and the other was "Abstracts of World Medicine" in England.

The medical field of the world had to choose one of them as a major abstracting service of the field, as it was too expensive to support two similar services at the same time. "Excerpt Medica" was the one which was chosen. This abstracting service started its publications in 15 sections of which all of them except one devoted to various specialities in medicine such as anatomy, biochemistry, surgery, and internal medicine.

The one which devoted to a particular disease was the section of tuberculosis which was broaden to pulmonary diseases later on.

Then, the trend of adding new sections devoted to some specific disease occurred. Some of the added sections are such as cancer, poliomyelitis, multiple sclerosis, etc.

Now the "Excerpta Medica" sections are expanded to thirty four, and is abstracting more than 100,000 articles from about 3,000 world medical journals.

To have many separate sections on various specialities and diseases makes it convenient for the research workers to screen the literature of their interest. However, it shows disadvantage in making a comprehensive, retrospective literature search on some aspects of medicine which cover more than one specialities. In these cases the searchers have to look in the indexes of various sections which might have included the literature searched.

In 1969 Excerpta Medica Foundation published "A Guide to the Use of the Excerpta Medica Abstract Journals"3) which lists about 4,000 biomedical terms most commonly used in their abstract services.

Although these selected biomedical terms are not directly related to the terms contained in the thesaurus of the Excerpta Medica's computerized information system, MALIMET, (Master List of Medical Indexing Torms) which is a compilation of approximately 60,000 prefered medical terms with many synonyms, they have been selected on the basis of the most commonly used terms, and therefore, they can be very useful in manual searches of medical literature using conventional secondary publications.

Against each of the 4,000 terms listed there is a reference to the section or sections, of Excerpta Medica in which relevant abstracts are most likely to be found. For instance;

CANCER CHEMOTHERAPY

- cancer
- pharmacology
- surgery
- internal medicine

CANCER CONTROL

- cancer
- public health

CANCER HORMONE THERAPY

- cancer
- endocrinology
- pharmacology
- internal medicine
- urology

As shown in these samples, the different sections indicated against each of the terms are not listed alphabetically, but are placed in order of suggested search sequence.

The guide also contains the classification system of each of the Excerpta Medica abstracting sections. The combined classification of the whole series form a comprehensive system of 3,000 polyhierarchically linked categories covering the entire biomedical literature.

"Excerpta Medica" also now completed a computer based literature search service. It is possible to produce various kinds of specialized service from this data bank. "Drugdoc" is one of the major by products of this computerized system.

Conclusion

"Index Medicus" and "Excerpta Medica" are two most important literature search tools in medicine. Both of them are now providing the computerized literature search services and also various kinds of specialized indexing and abstracting services. To make any literature search in medicine we have to use at least one of these bibliographic tools. They are all well-designed. But to use them effectively, one has to be familialized with their strong points and weak points.

Either of the services claims to cover all the important medical journal literature, however, a recent study4) showed us that the duplication of the coverage of these two was not as large as one might assume. Which means, that, we will need both services beside, may be "Chemical Abstracts and Biological Abstracts" if we expect to have a fairly complete coverage of medical field in literature search.

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GENERAL COMMENTS ON MEDLARS

Yoshinari Tsuda

When the number of scientific journals reached to 300, the first abstracting service was said to appear. Since then, abstracting and indexing services have kept growing as journals have grown. Recently, facing the situation of so called "information explosion" and "flood of literature", these services began to show some change in their forms, coverage, and other feature.

Abstracts were originated to provide research workers and other scholars with means for coping with rapidly increasing quantities of publications. Now abstracts themselves have become so columinous that numbers of specialized indexes have to be published in various fields to replace the use of abstracts by those who need up-to-date and speedy access to journal publications.

Trends in abstracting and indexing

Scott Adams and Dale B. Baker discribed in their article in 1968[1], the recent trends in scientific abstracting and indexing services as follows.

1) The revolution in science, primarily caused by increased public interest and public funding, is having major efforts on scientific institutions which are being converted from traditional discripline to mission orientation. Abstracting and indexing, viewed as a scientific institution, have been affected by this revolution.

2) Increased basic concern with the problems of coexistence of abstracting services in support of the disciplines and in support of missions has led to comprehensive studies which recommend a network of the various abstracting and indexing services.

3) The number of abstracting and indexing services (about 1,850 in 1963) is growing with the increased growth of the literature. While few new, large, discipline-oriented abstracting services appear to be developing, more mission-oriented services are starting earch year than are being terminated.

4) There is an increasing emphasis on defining and standardizing coverage of abstracting services, both mission- and discipline-oriented, for the purpose of achieving understanding, compatibility, and coordination of the abstracting efforts.

5) Major discipline- and mission-oriented abstracting services are systematically transforming from traditional formats to more flexible information-processing and disseminating programmes.

6) New computer-based techniques of abstracting and indexing make possible multiple, interlinked processing of information across discipline borderlines with no less of speed or effectiveness.

7) By recognizing that the scientific and technical abstracting and indexing problem is in reality a multitude of different, interacting problems to which there is no single, all-purpose answer, we have begun to construct a powerful framework to satisfy our future needs for information.

Two of the distinct trends among them are appearance of specialized services for mission-oriented fields such as air pollution, water pollution, aerospace science, etc. and the utilization of computer not only in aid of compiling and printing these services but also transforming them into the computerized data bank of literature.

For instance, in the field of chemistry, Chemical Abstracts Service introduced "Chemical Titles" in 1961, using a new indexing technic which is called KWIC (Key Words In Centext) and indexes journal articles automatically by computer. This was followed by "Chemical-Biological Activities in 1965 and Polymer Science and Technology in 1967. Chemical Abstracts Service (CAS) has been working towards the development of an integrated chemical information system since 1959, with the aim of complete operation of the system by the 1970s. The aim of CAS is said to be "--- not the computerization of the manual publishing system, but the development of a comprehensive, integrated information system--- The goal of this work has been to eliminate redundant human intellectual and manipulative effort in processing information, and at the same time, to create a broaden range of more responsive information services, only some of which will be the traditional publications."

This means in short "single analysis/multiple use".

The same philosophy is behind of all other computerized systems now appearing in almost all major fields in science such as MEDLARS and Excerpta Medica in Medicine, BIOSIS in biology, INSPEC in physics, Engineering Index system in engineering, etc.

Based on these discipline-oriented general data bank, many specialized indexes and abstracts are being produced. For instance, Recurring Bibliographies such as Index to "Dental Literature", "Cerebrovascular Bibliography", "Rheumatology

Bibliography", "Fibrinolysis and blood coagulation bibliography", etc. are produced from MEDLARS for these specialized groups. Similarly, "Abstracts of Mycology" is produced by BIOSIS.

Some of the mission-oriented services such as "Air Pollution Abstracts" and "Water Pollution Abstracts" are cross cutting many fields covered by number of the dicipline oriented services.

MEDLARS

From 1960 to 1963, "Index Medicus", the most important index in medical field, was produced by a partially mechanized system that utilized paper tape Typewriters, punched card equipment, and a Listomatic Camera. Although this system worked effectively in the publication of "Index Medicus" and related publications, it had very limited information retrieval capability. Primarily because of the limitation of the Listomatic System, and also because of the rapidly growing size of "Index Medicus", it was decided to begin planning a new and more highly mechanized system, using a computer.

The major objectives for the MEDLARS system as stated in 1961 were as follows.

1) Improve, the quality of and enlarge (broaden the scope of) "Index Medicus" and at the some time reduce the time required to prepare the monthly edition for printing from 22 to 5 working days.

2) Make possible the production of other compilations similar to "Index Medicus" in form and content (but in more specific medical subject areas and hense smaller in size).

3) Make possible, for "Index Medicus" and other compilations, the inclusion of citations derived from other sources, as well as from journal articles.

4) Make possible the prompt (a maximum of two days) and efficient servicing of requests for special bibliographies, on both a demand and a recurring basis, regularly searching up to five years of stored computer files.

5) Increase the average depth of indexing per article (number of descriptive subject terms per articles) by a factor of five, i.e., ten headings versus two.

6) Nearly double the number of articles that may be handled (indexed and entered into the computer) annually - from 140,000 to 250,000 in 1969.

7) Reduce the need for duplicative total literature screening operations (at other libraries and information centers).

8) Keep statistics and perform analysis of its own operations to provide the information needed to monitor and improve system effectiveness.

9) Permit future expansion to incorporate new and as yet not completely defined- and hence secondary objectives.

Some of these objectives have been completely accomplished while there are some others which are still to be endeavored to.

There are three major products of MEDLARS. They are (1) printed "Index Medicus", (2) Recurring bibliographies for various specialized fields, (3) individual demand searches of the literature tailored to the stated requirements of an individual or small group of people working on the same project.

The system can be described functionally as consisting of three major parts: an Input Subsystem, a Retrieval Subsystem, and a Publication Subsystem.

MEDLARS is covering more than 2,200 world medical periodicals and adding to its file the citations of more than 200,000 articles per year.

The end product of a demand search is a list of citations on some subject or subjects which are supposed to meet the requester's need.

A machine search is not always as fast and precise as one may thinks ... or hopes. There have been some studies which compare the results of machine searches and manual searches. Most of these studies discovered the infavorable results for the computerized literature search.

Lancaster1) made an evaluation study of the MEDLARS' demand search in 1966-67. The results are shown in the following table.

Table 1. Summary of average recall and precision ratios for 299 searches.

Overall precision ratio	50.4%
Precision ratio based on major value articles only	25.7%
Overall recall ratio (complete recall base)	57.7%
Recall ratio based on major value articles only (274 searches)	65.2%

He made a number of recommendations to improve the all operating efficiency of the system. Many of the recommendations have been adopted and the system's efficiency has been greatly improved.

Although, present day, computerized information retrieval systems still have their limitation, especially in their costly operation and inferior relevancy, it is certain that the development of technology will eventually make them the major instruments in bibliographic control and information service activities in all subject fields.

The MEDLARS, for instance, is about to go into the second stage of its development. It is called MEDLARS II and is planning to utilize further an on-line system, which has been experimentally used between MEDLARS and SUNY, a computerized information retrieval network of the State University of New York.

Whether one likes it or not, an age of computerized information system is surely coming rapidly into the documentation and library science fields.

MEDLARS' network and medical school libraries.

One of the most important achievement of MEDLARS is the establishment of the network of dicentralized search centers which provide the demand search services to their clienteles by using the tapes produced by the MEDLARS. This network is getting to be a core of the international network of medical literature information service.

However, the MEDLARS' network is still in its developigg stage and some of European countries such as England, Sweden, France and the countries around them and Australia are now the only countries outside U.S.A. which are covered by its service.

Japan is joining the network but is still in an experimental stage, and it will take sometime for the center in Japan to begin its actual service to her clienteles.

The MEDLARS' network plan is appeared to be a flexible one to meet the changing situation. But its objectives are seemed to remain as they were in 1963 when they started the MEDLARS' service:

They were2)

1) The sharing of a national asset, created by public funds, in order to realize maximum benefits to the advance of the health sciences and practices.

2) The avoidance of economic wastage resulting from uncoordinated duplicative indexing. The indexing function must remain centralized.

3) The encouragement of compatibility among local mechanized storage and retrieval systems. The wider MEDLARS tapes are used, the better the chances of maintaining national standards in a potentially chaotic field.

4) The encouragement of further research and development in mechanized storage and retrieval. We have never claimed more for MEDLARS than that it is a first rough screening of the medical literature. By making our tapes generally available, we shall be supplying the materials for further needed research and development.

5) The multiplication of the MEDLARS search potential in the national interest. We anticipate that the limits placed on MEDLARS services at NLM will be soon reached. Multiple search centers are needed to meet the volume of demand we anticipate.

6) The renaissance of libraries as institutions for the maintenance and servicing of the scientific record.

The last objective was further explained as follows:

"Libraries have been by passed in the scientific revolution. On all sides we hear that they are outmoded, hopelessly unable to keep up with the flood of literature, that they need to be replaced by some new and drastically different system, such as the science information center. ---(However,) as a time when interdisciplinary research requires materials from many scientific areas, comprehensive, well-stocked local libraries provide the most efficient reservoir. To match the power of retrieval with the power of the information retrieved, we believe that the decentralized search centers should be associated with libraries, and not with some new, untried form of service institution. We look to this association to bring about a renaissance in the significance of the library function, and to open doors to a new area in librarianship."

In 1969, Dr. Cummings, the director of the National Library of Medicine (NLM), identified the objective of the biomedical communication network2) as "improved and increased information transfer consistent with demonstrated needs of both the individual physician and the medical community --- does not connote a rigid unchanging snare of interconnection; it does signify a sharing of resources systematically and constructively so that improved services can be provided with maximum efficient utilization of available resources-manpower, fiscal and technological".

To materialize this objective, the NLM has been establishing decentralized MEDLARS Search Centers even outside of U.S.A. and it also has been endeavoring to build up a network of library resources, which are called as Regional Medical Libraries.

In this way the library is assuming the role of the central unit in the national and international network of both medical information and its carrier, the printed literature.

The NLM with its many years experience of MEDLARS' operation has expanded its territory even to audiovisual resources and related specialized services. The establishment of Lister Hill National Center for Biomedical Communication in 1968 indicates that the NLM is pushing its boundary of operation beyond the traditional domain of printed information.

In 1960s, MEDLARS and other large computerized services might have been somebody else's trouble (or glory), to most of us, librarians and documentalists in Asian countries, but in a few years it will be a very real, basic information source in biomedicine even in this part of the world. Therefore, we should plan our information service activities with these new giants and their implication in mind.

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IR Services in Medicine

Takeo Urata

No single library satisfies every needs of the library users. Nowadays nationwide cooperative system is badly needed to meet the increasing demands for more better information in quicker and more effective ways.

I would like to explain how we are doing and what we are trying to have, desirably in the near future, to set up really an effective network for information service in medicine.

Geographically speaking the Japan Medical Library Association has nine regions throughout this country, namely, Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kyoto, Osaka, Chu-Shikoku and Kyushu. For each region one of the member medical libraries is supposed to be designated as the center for the region, like Tohoku University Medical Library for the Tohoku or Kyushu University Medical Library for the Kyushu Region. Normally the member libraries in each of nine regions hold several meetings in a year where they discuss such problems as periodical subscription for the next year, interlibrary loan procedure, provisions making for telex communication and other technical routines.

The Japan Medical Library Association has been more active in interlibrary loan service than any other types of libraries here in this country. The Association has recently published "Union List of Medical Periodicals in the Medical Libraries of Japan: Periodicals in Foreign Languages, 5th edition." Besides sending out requests to other member libraries, the Association's Central Office is practically performing as the clearing house for authorizing and forwarding many requests (roughly a thousand requests per year) to the National Library of Medicine in U.S.A. These requests coming to the Central Office from the member libraries throughout the country are naturally for the materials which any of the member libraries does not possess. And also the Central Office sends quite a number of requests to the American Dental Association's Library. For domestic and international interlibrary loan, a union catalog is sine qua non, and after our long experience we are provided with a fine union catalog which we are very proud of. We also have a union catalog for the medical periodicals in Japanese language. For preparing a union catalog three points have to be considered. 1) Every member libraries should have at least one trained librarian. She or he is supposed to have enough knowledge and technique for preparing a union catalog. 2) Simple

and exact methods should be adopted to express holdings and location.
3) Full understandings should prevail among member libraries concerning kinds of heading to be taken (e.g. international congress), periodical's history, etc.

A union catalog ought to be out-of-date right after its publication. We have been trying to publish a new edition every five years. However, a union catalog does not give us any information about the new journals taken by the member libraries. Since we cannot expect rapid increase in book purchasing budget, we think it necessary to secure certain variety of new journals cooperatively for the network of the Association as a whole. For this purpose we publish "List of Current Periodicals Acquired by the Japanese Medical, Dental and Pharmaceutical Libraries", which is a yearly publication, edited by one of the member libraries and subsidized by the Ministry of Education. This is simply an alphabetical list of every medical journals acquired by the member libraries, and also by the member libraries of the Japan Pharmaceutical Library Association, followed by the numbers standing for the member libraries. In course of preparing such kind of bibliographic tools we have found we have still more than one thousand titles to go, if we are to cover all of the titles indexed in Index Medicus and abstracted in Excerpta Medica. We are moving towards two directions. First, we are trying to secure such extent of journals by cooperative acquisition among the member libraries. Two of the nine regions previously mentioned have started experimental project. Each of the member libraries in those regions sets aside one hundred thousand yen out of their total book budget and pools it for cooperative purchasing of new journals. And they get together, discuss and decide what journal to be taken by which library. Secondary, we negotiated with the Japan Information Centre for Science and Technology for making deposit with some of the member libraries. A committee was formed within JICST and selected about nine hundred journals which any of the member libraries has not taken so far. Three libraries, namely Tokyo University, Keio University and Osaka University were selected as deposit libraries and are receiving individually about three hundred journals. With these two approaches we are expecting we should seldom send interlibrary loan requests abroad for the materials published after 1970. But for the materials published before 1969 we have not established nationwide arrangement yet.

I have to mention briefly our union catalog system for monographs and books. At the moment Keio University Kitasato Memorial Medical Library is taking responsibility for keeping the union catalog for the Association. Each member libraries are supposed to send in cataloged cards for every titles they acquired and Keio files them alphabetically by author. This union catalog is therefore kept in card form and the member libraries inquires and get answers by way of telex, telephone, or letter.

Now it is needless to say the member libraries of the Association, though they are called medical libraries, are general in nature. Next step should be taken to set up information centers in special fields. By information centers are meant such as National Institute of Neurological Diseases and Stroke, and Brain Research Institute at UCLA in USA. We are hoping to set up one information center in each of the nine regions of the

Association. Perhaps such information center may be attached to one of the member libraries of the region. Keio has already advanced by its own efforts to set up 'pollution Information center', but subject specialities to be allocated on nationwide basis should be discussed in due course.

Only with the member libraries of the Association and the information centers in special fields, the network for information retrieval in medicine will never be complete or really effective. At this stage we need a large agency which is comparable to the National Library of Medicine in USA. The JICST is experimenting searching literature by Medlars' magnetic tapes, but it is not the final service agency for Medlars by any means. Moreover, the Excerpta Medica has developed a large data bank for medical and drug information and also made the magnetic tapes available abroad at cost. None of the member libraries of the Association is qualified for retrieving function by those tapes. And we need urgently an central agency which deals with indexing and abstracting the Japanese medical literature comprehensively and with preparing other necessary secondary materials. If we think of the great number of practitioners who are not served directly by any of the medical school libraries, the coming agency will be preferably a medical library as well as an information center. However, so long as it functions as MT retrieving center, and indexing and abstracting center, it has not to be a medical library with vast collection. For the practitioners some other solutions might be thought of.

The network consisting of the member libraries of the Association, the information centers in special fields and the national library of medicine is our direct goal to realize in this country.

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CONTENT ANALYSIS AND ABSTRACTING

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I. Introduction

An abstract summarizes the contents and conclusions of an article, points out new information in the paper, and indicates the relevance of the work. With the so-called "explosion of information," scientific or otherwize, the scientists cannot spend their valuable time in the laboratory to reading other people's work. Even if they had time to read scientific journals, he may be reading more "irrelevant" work than those he must read. In other words, there must be selection of the work or papers to be read in order to make his reading worth the time he spends on it. To enable the scientists to make this selection, individual papers and articles must be indexed and abstracted. An index serves the purpose of selecting "relevant" papers and articles to a certain extent but detailed contents of an article cannot be learnt from an index. An index will and must serve to make a "primary" selection, narrowing down a vast amount of information to a sizable heap. This heap will then have to be selected by an abstract. Therefore, the purpose of an abstract is to point out key features of a given paper and to allow the reader to determine whether he needs to consult the original document. An abstract is never intended to substitute for the original article but it must contain sufficient information to allow a reader to ascertain whether he should read the original paper or not. In addition, there is the problem of the language used in the original paper or article. If the original article is written in a fairly universally known language, such as English or French, an abstract can be fairly short. If the original is in a language which is not universally known or understood, such as Japanese and other oriental languages, then the abstract should be a little lengthy, so as to allow the reader to decide whether the original article should be translated into his own language. Translation is a difficult business, especially when the article deals with scientific or technical subjects, and it is very costly. It would not do if a large expenditure is made for translating an article and then to be found that the article is not what the scientist needed. It would be a great loss of time and money. In this age of accumulating information and shortage of working hours, such a loss of time and money cannot be allowed.

Just to show the increase of scientific information, the number of abstracts appearing in the Chemical Abstracts will be taken up. When the Chemical Abstracts started in 1907, the total number of abstracts that appeared in that year was 7,975. By 1957, just 50 years later, this number had reached some 135,000 per year, about 17 times the original number. In 1967, the number of abstracts was nearly 240,000, and it was almost 250,000 in 1969, the latest figure. The first millionth abstract was published in 1938, just 32 years after the Chemical Abstracts started. It took only 19 years to reach the second millionth abstract (1956), only 8 years to reach the third millionth abstract (in 1963), and only 4.5 years to reach the fourth millionth abstract (in 1968). These abstracts are made from over 13,000 titles published in 106 nations, written in 56 different languages. Incidentally, about 55% of the original articles is written in English, little over 20% in Russian, followed by about 7% in German and about 5% in French. (Figs. 1 and 2)

2. Classification

Abstracts can be classified in various ways; from the style of writing, from the writer of the abstract, and from how they are utilized. The term "abstract" is actually used in a loose sense and not strictly limited to the term defined by ISO* and UNESCO/ICSU* which will be explained later.

Classification according to

style:	Indicative abstract
	Informative abstract
writer:	Author abstract
	Objective abstract
user:	General abstract
	Specific abstract
	In-house abstract

Indicative abstract is a brief account of what the paper reports, the range of topics covered, and conclusion reached. If the title is written correctly and adequately, the title alone would be sufficient to give this amount of information. Only in unusual cases should it contain more than 50 words.

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* ISO = International Organization for Standardization

UNESCO = United Nations Educational, Scientific and Cultural Organization

ICSU = International Council of Scientific Unions

Informative abstract summarizes the principal findings of the work reported in the paper; stating briefly the problem or the purpose of the research, indicates theoretical or experimental plan used, accurately summarizes the principal findings, and points out major conclusions. It should be borne in mind that the primary purpose of an informative abstract is to provide access to the original literature, not serve as a substitute for it. Such an abstract can be written in 200-300 words.

Author abstract, as the term implies, is a brief summary of a paper written by the author of such a paper, and the "synopsis" accompanying a paper in scientific journals corresponds to it. Since it is published with the original paper, it tends to become brief, if the original is written in English, and rather lengthy if the original is in little known language. Since this is written by the author of the original paper, who is well acquainted with the subject matter, there is an advantage of the problems and importance of the work being pointed out. At the same time, the abstract tends to lack objectivity and becomes self-asserting. Increasing importance is being attached to synopsis or author's abstract printed with the article because it can be used by abstracting journals for a more rapid processing.

Objective abstract is an abstract prepared by someone who is not the author of a paper, usually called an abstractor. An abstractor of a scientific paper must be well versed in the subject dealt in the original article and must also be versed in the language in which the original paper is written. Although an objective abstract can be written, abstracting is not an easy task and not everybody is endowed with the capacity to write a "good" abstract. This also requires time and money.

General abstract is a series of abstracts printed and published for general public. Abstracts printed and published in various abstract journals correspond to it. Since the readers of such abstract journals are specialists in that particular field, use of technical terms are permissible but highly specialized terminology, abbreviations, and references to illustrations and tables in the original article should be avoided. Style of abstracts differ with each abstract journal.

Specific abstract is an abstract written specifically for a very narrow field, specific subjects, or for specific uses. For example, abstracts prepared in the field of therapeutic drugs, medical instruments, certain commercial goods, etc., which are read only by people interested in that field, correspond to it.

In-house abstract is an abstract prepared with an organization, institution, or a laboratory for use within that body. The subject taken up may be very narrow and highly specialized or scattered over a wide range. Since the abstracts are used within an organization, they may be written in a special style suited for their use, with liberal use of special terms and abbreviations or symbols, but such terms, etc., must be defined within that organization.

3. Content and Style of an Abstract

Abstracts should be written in a simple languaged and in as concise a term as possible. It should state briefly the purpose of the research or the problem, indicate the theoretical or experimental work, summarize the principal results, and point out major conclusions. The abstract should provide adequate data for the generation of index entries concerning the kind of information present. A complete sentence, rather than a mere list of headings, should be used, and jargon should be avoided. Standard scientific nomenclature, rather than proprietary terms, should be used and, if a particular trade name must be used, a generic name or a scientific term must be supplemented. Abbreviations should be avoided except those in international usage (e.g., units of weight and measurement, physical constants, mathematical expressions, etc.). If the use of abbreviations would shorten the abstracts considerably, they may be used after adequate definition or explanation. Highly technical terms or novel terms used by the author should also be avoided unless they are defined or explained.

For experimental work, reagents used, conditions of reactions, and methods used should be included. For new methods, basic principle, range of operation, and degree of accuracy should be included. Special mention must be made on the names of new compounds, minerals, animal and plant species, etc., new numerical data such as physical constants and statistical results, and new items and observations, even though some may be incidental. The author's conclusion should be given as such, and the abstractor must not add appraisal or criticism of the work. Reference to illustrations, tables, and literature should not be made unless they can be reproduced in the abstract. Chemical structures are often reproduced in the abstract, especially if the structure is highly complicated and reproduction of the structural formula will considerably shorten the abstract.

In medical and biomedical work, the use of a proprietary name or trade name of a drug is sometimes essential. In such a case, the name must be followed by a trivial name or chemical name of that drug, or its official name. Commercial name and model number of instruments used for measurement are sometimes necessary.

An abstract should, in general, contain the following components:

* The purpose and scope of the work, if it is not evident from the title.

* New reactions, compounds, materials, techniques, procedures, apparatus, data, concepts, and theories.

* New applications of established knowledge.

* The results of the investigation.

* The author's interpretation of the results and his conclusions derived from them.

Literature references are usually not included in abstracts in abstract journals but in the "in-house" abstract, it sometimes proves helpful to add literature references, especially the work of the same author preceding or following the work being abstracted.

4. Content Analysis

Depending on what the publication to be abstracted is, there would be a different system in obtaining pertinent data. If the publication is a scientific journal, or scientific and technical articles, they will be divided generally into the following subheadings:

(a) Title, name(s) of author(s), name of organization.

(b) Synopsis (Abstract, or Summary)

(c) Main text (Introduction)

(d) Experimental (Materials and Method, Result, Discussion)

(e) Conclusion (Summary)

(f) Literature references

The terminology used in various scientific journals may differ, and some of these items may be missing in an article, but scientific papers generally follow this format.

In looking for general ways for abstracting, the most simple and good example is a well written newspaper article. It begins with a heading (title) in large type which gives in minimum number of words what the article is about. If the reader is attracted by the heading, then he reads the "lead" sentence which attempts to tell the reader enough about what happened to allow him to decide whether he is interested in reading the rest of the article. This "lead sentence" corresponds to an abstract. It does not give too much detail but enough to rouse the reader's interest. This is followed by a lengthy, main body of the article which tells the reader what happened from the beginning to the end, supplying details about the place, time and date, people involved, and its impact on society. For a busy reader, the 'lead sentence' will suffice, or even the heading alone may be enough for some kind of articles.

Abstracting of a scientific article will not be that easy but the process is the same. If the title is well written, with a thought for "indexable words," then the title alone will be sufficient to know what the article is "about." If the article is preceded by a "synopsis" (author abstract or summary), this is gone over carefully. When a synopsis accompanies an article, it is usually a brief summary of major experiments, findings, and principal conclusion. By supplying experimental data and physical constants from the body of the text, illustrations, and/or tables, a fairly useful abstract can be prepared from the author's synopsis.

If an article is not preceded by a synopsis or author's abstract, there is usually a sub-heading "Conclusion" or "Summary" at the end of an article. More often than not, this "Conclusion" is actually a summary of the work reported and usually gives more detail than the "synopsis" at the beginning of an article. Major experimental data and interpretation of the result obtained will usually be found in this "Conclusion" or "Summary" which will be a good source for an abstract.

In the case of a monographic work or a book, there is usually a brief summary of the work on the book cover or inside leaf, which will be useful in knowing what the book is about. Below is a system of "pre-reading" recommended by rapid reading exponents in U.S.A.

(a) Read the Contents, look over the index, and read the Preface or Foreword.

(b) Skip through the first and last chapters.

(c) Read or skim through the middle chapters which contain summarization of the foregoing chapters, with reference to the Contents.

For each chapter:

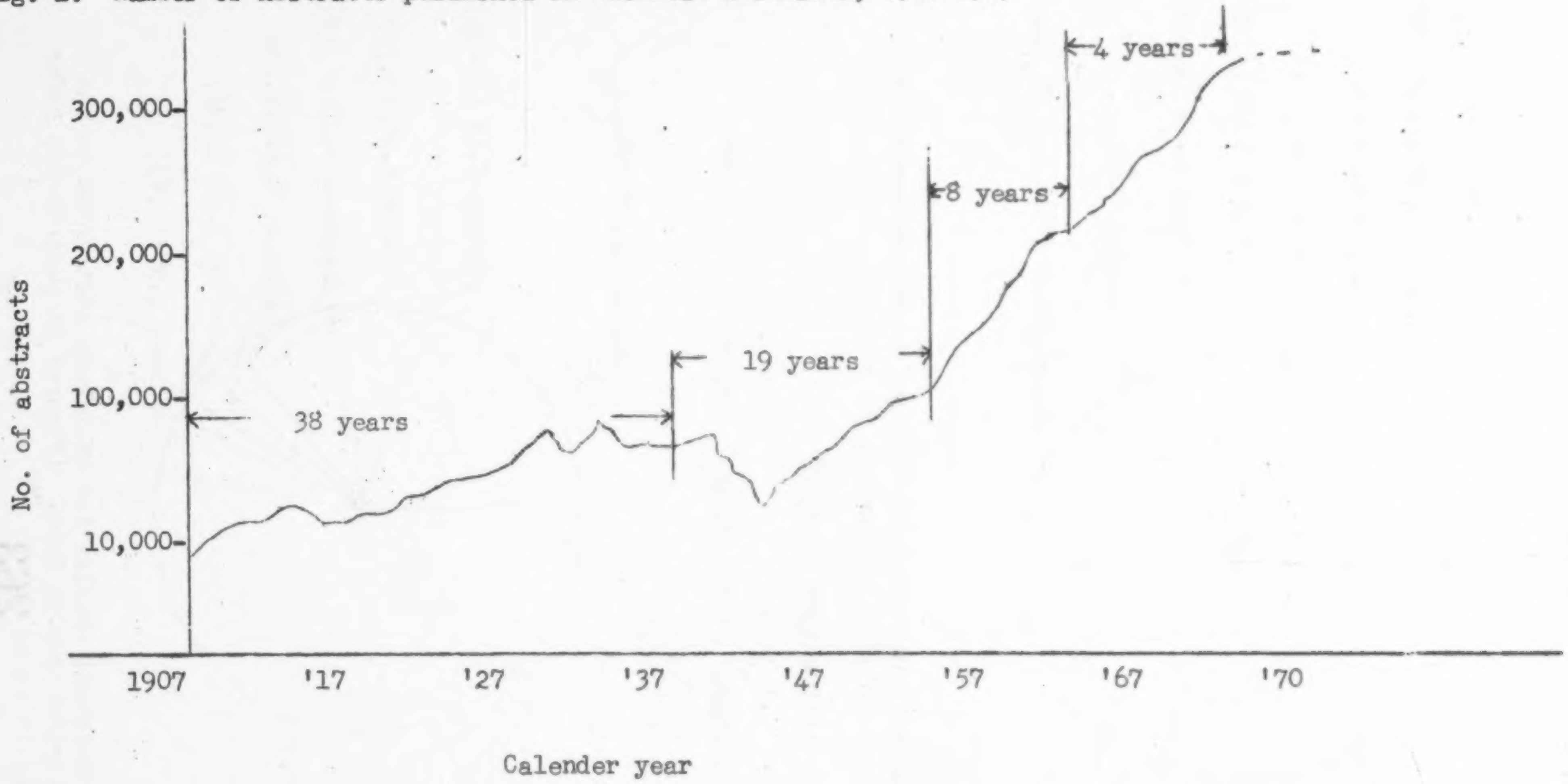
(d) Read the first few paragraphs.

(e) Read the headings and sub-headings, and first line or first sentence of each paragraph.

(f) Read the last few paragraphs.

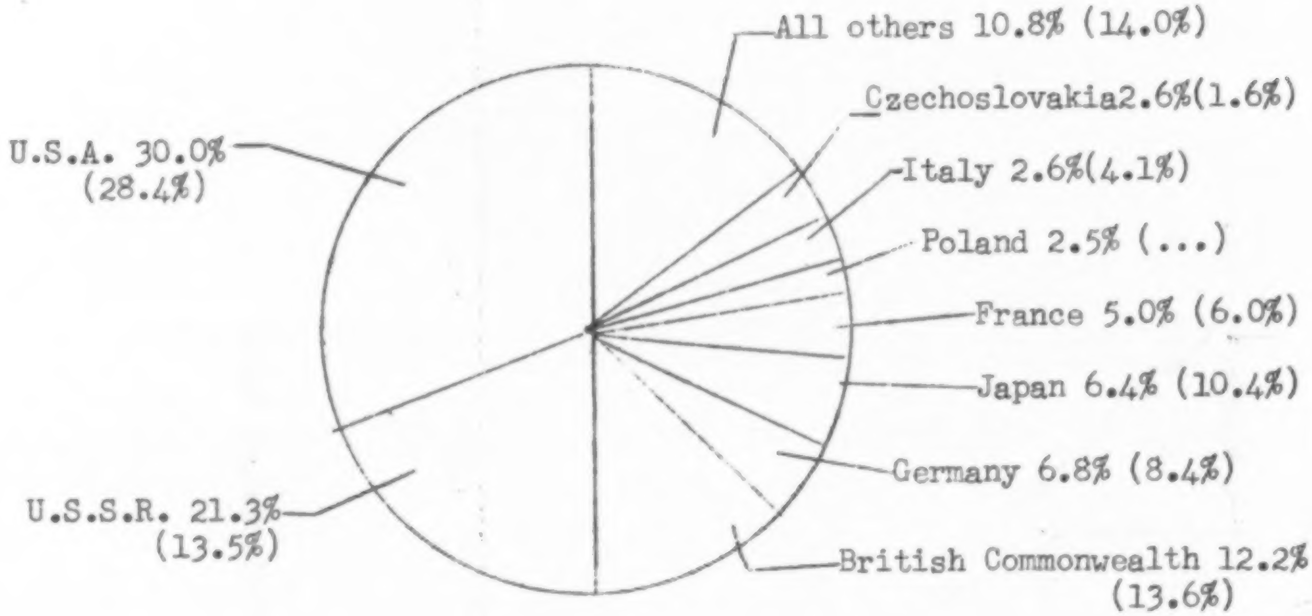
To scientists wallowing in the sea of scientific information, the most important factor is the chain of inquiry which must exist intact between the searcher (scientist) and the original source of information. An important link in that chain is the abstract, and an abstractor has the difficult decision of what to retain and what to reject. This decision must be consistent. It will not benefit the users of an abstract system if abstracts prepared by different abstractors, or by the same abstractor on different occasions, are based on varying principles. The pattern of selection will necessarily alter from discipline to discipline. A selection pattern for chemistry would be of no use in astronomy or medicine. Whatever the field of science and technology, an abstractor must learn to recognize "useful" and "relevent" information.

Fig. 1. Number of Abstracts published in Chemical Abstracts, 1907-1969



(Constructed on data published in CAS TODAY and in Chemical and Engineering News)

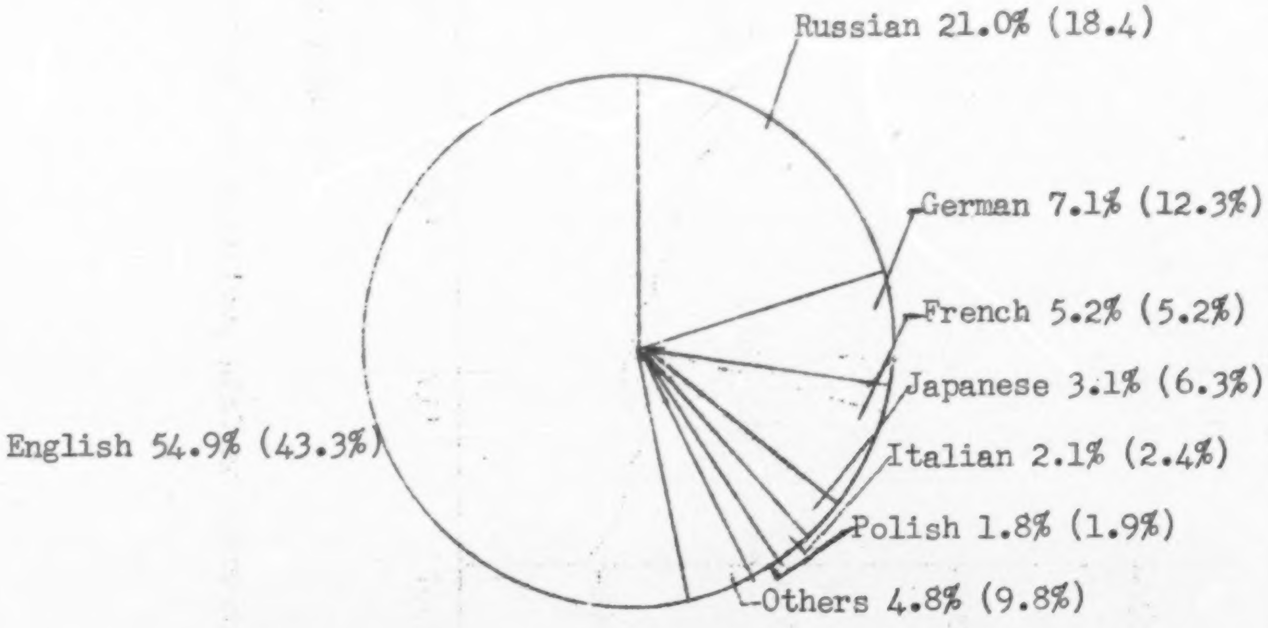
Fig. 2. Sources of the World's Chemical Literature*



* National origin of papers abstracted in Chemical Abstracts during 1966. (Figures in parentheses refer to percentage in 1956)

(Taken from CAS TODAY - 60th Anniversary Edition)

Fig. 3. Languages of the World's Chemical Literature*



* Language of original publication of papers abstracted in the Chemical Abstracts during 1966. (Figures in parentheses refer to percentage in 1961)

(Taken from CAS TODAY - 60th Anniversary Edition)

List of illustrations used

Fig. 2. Sources of the World's Chemical Literature

(Taken from CAS TODAY - 60th Anniversary Edition published by the Chemical Abstracts Service. Copyright 1967 by the American Chemical Society, 1155 Sixteenth St., N.W., Washington, D.C., U.S.A.)

Fig. 3. Languages of the World's Chemical Literature

(Same as above)

Fig. 4. Newspaper Article

(Taken from The Japan Times, p. 3, Thursday, July 2, 1970. The Japan Times, Shibaura 4-5, Minato-ku, Tokyo)

Fig. 5. Example of Author's Synopsis and Objective Abstract

(Author's synopsis taken from the Chemical and Pharmaceutical Bulletin, Vol. 18, No.2, p.356 (1970), Published by the Pharmaceutical Society of Japan, Hongo, Tokyo)

(Abstract taken from the Chemical Abstracts, Vol.72, p.295, 1970, published by the Chemical Abstracts Service, Columbus, Ohio 43210, U.S.A.)
(Abstract No.99945h)

Fig. 6. Example of Author's Synopsis and Objective Abstract (Author's synopsis taken from the Journal of Organic Chemistry, Vol. 35, No. 3, p. 565, March 1970, published by the American Chemical Society, 1155 Sixteenth St., N.W., Washington, D.C., U.S.A.)

(Abstract taken from the Chemical Abstracts, Abstract No. 99948m) same as above Fig. 5)

Fig. 7. Example of Author's Summary and Objective Abstract

(Author's summary taken from Biochimical et Biophysical Acta, Vol. 202, No. 1, p. 56, 1970, published by the Elsevier Publishing Co., P.O. Box 211, Amsterdam C, Netherlands)

(Abstract taken from the Chemical Abstracts, Vol. 72, p. 164 (Abstract No. 98424a), 1970, publisher same as above)

Fig. 8. Example of Author's Summary and Objective Abstract

(Author's summary taken from the British Journal of Cancer, official journal of the British Cancer Campaign, Vol. 23, No. 4, p. 786, 1970, published by H.K. Lewis and Co. Ltd., 136 Gower St., London W.C.1, England, U.K.)

(Abstract taken from the Chemical Abstracts, Vol. 72, p. 164 (Abstract No. 98427d), 1970, publisher same as above)

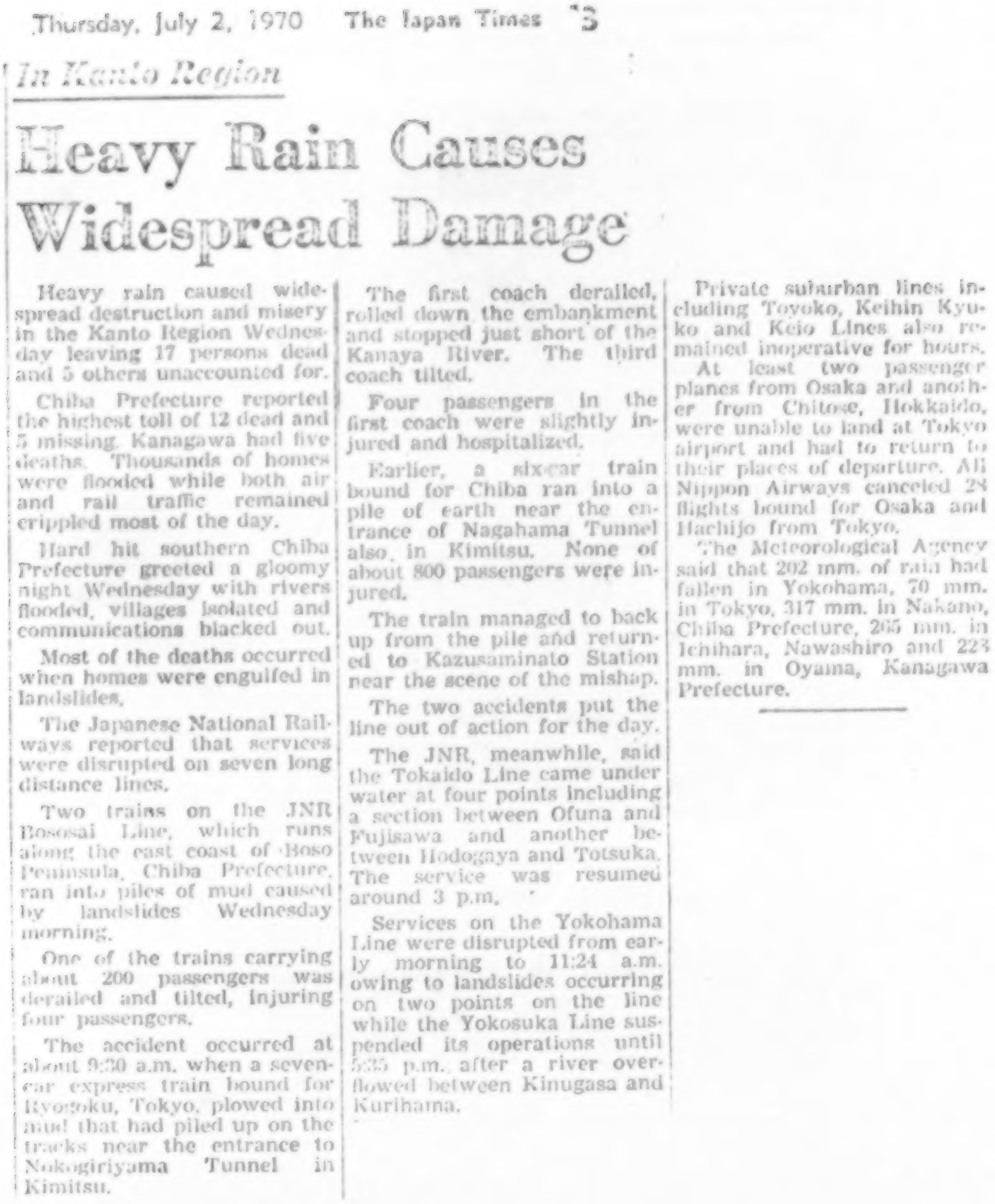
Fig. 9. Examples of Author's Abstract and Objective Abstract

(Authors' abstracts from GANN, Vol. 60, No. 6, December 1969, Abstract No. 84 and No. 87, published by the Japanese Cancer Association, c/o Cancer Institute, Tokyo).

(Abstracts taken from the Chemical Abstracts, Vol. 72, p. 165, Abstracts No. 98438h and No. 93439j, 1970, publisher same as in Fig. 5)

Fig. 10. ISO Recommendation R214 Abstracts and Synopsis.

Fig. 4. Newspaper Article



Thursday, July 2, 1970 The Japan Times 3

In Kanto Region

Heavy Rain Causes Widespread Damage

Heavy rain caused widespread destruction and misery in the Kanto Region Wednesday leaving 17 persons dead and 5 others unaccounted for.

Chiba Prefecture reported the highest toll of 12 dead and 5 missing. Kanagawa had five deaths. Thousands of homes were flooded while both air and rail traffic remained crippled most of the day.

Hard hit southern Chiba Prefecture greeted a gloomy night Wednesday with rivers flooded, villages isolated and communications blacked out.

Most of the deaths occurred when homes were engulfed in landslides.

The Japanese National Railways reported that services were disrupted on seven long distance lines.

Two trains on the JNR Bososai Line, which runs along the east coast of Boso Peninsula, Chiba Prefecture, ran into piles of mud caused by landslides Wednesday morning.

One of the trains carrying about 200 passengers was derailed and tilted, injuring four passengers.

The accident occurred at about 9:30 a.m. when a seven-car express train bound for Ryogoku, Tokyo, plowed into mud that had piled up on the tracks near the entrance to Nokogiriyama Tunnel in Kimitsu.

The first coach derailed, rolled down the embankment and stopped just short of the Kanaya River. The third coach tilted.

Four passengers in the first coach were slightly injured and hospitalized.

Earlier, a six-car train bound for Chiba ran into a pile of earth near the entrance of Nagahama Tunnel also in Kimitsu. None of about 800 passengers were injured.

The train managed to back up from the pile and returned to Kazusaminato Station near the scene of the mishap.

The two accidents put the line out of action for the day.

The JNR, meanwhile, said the Tokaido Line came under water at four points including a section between Ofuna and Fujisawa and another between Hodogaya and Totsuka. The service was resumed around 3 p.m.

Services on the Yokohama Line were disrupted from early morning to 11:24 a.m. owing to landslides occurring on two points on the line while the Yokosuka Line suspended its operations until 5:35 p.m. after a river overflowed between Kinugasa and Kurihama.

Private suburban lines including Toyoko, Keihin Kyuko and Keio Lines also remained inoperative for hours.

At least two passenger planes from Osaka and another from Chitose, Hokkaido, were unable to land at Tokyo airport and had to return to their places of departure. All Nippon Airways canceled 28 flights bound for Osaka and Hachijo from Tokyo.

The Meteorological Agency said that 202 mm. of rain had fallen in Yokohama, 70 mm. in Tokyo, 317 mm. in Nakano, Chiba Prefecture, 265 mm. in Ichihara, Nawashiro and 223 mm. in Oyama, Kanagawa Prefecture.

(Taken from Japan Times, July 2, 1970)

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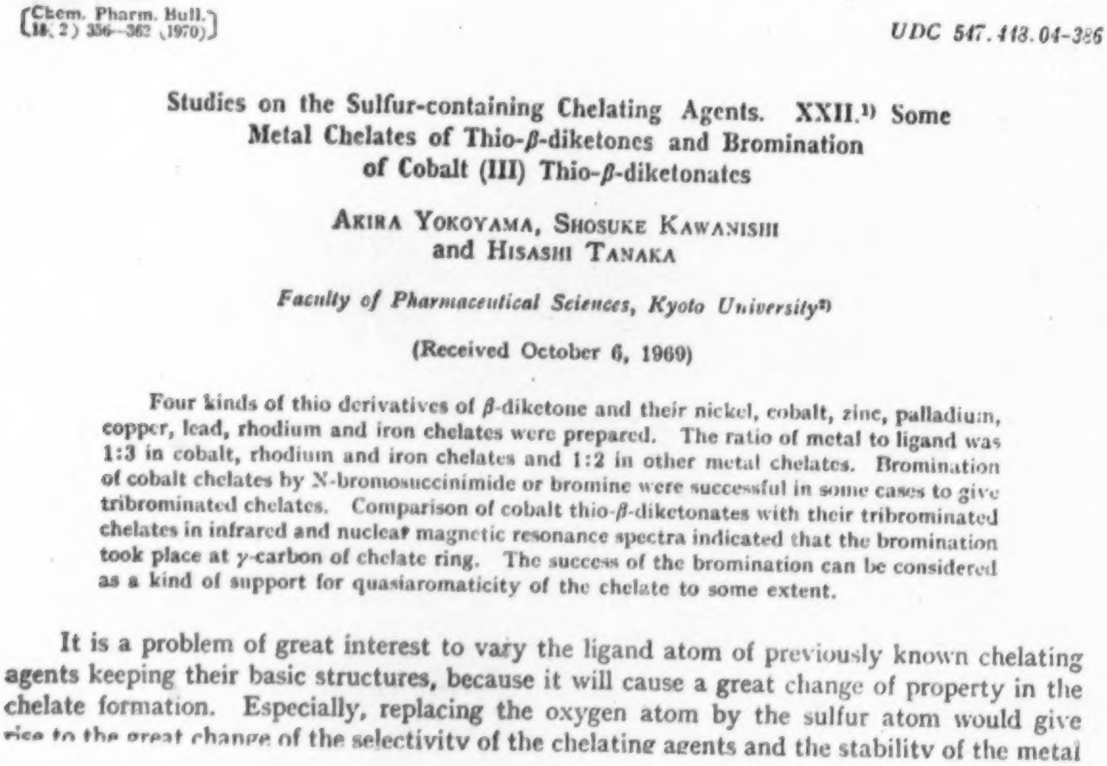
Fig. 5. Example of Author's Synopsis and Objective Abstract



[Chem. Pharm. Bull. 18(2) 356–362 (1970)]

UDC 547.413.04-386

Studies on the Sulfur-containing Chelating Agents. XXII.[1] Some Metal Chelates of Thio-β-diketones and Bromination of Cobalt (III) Thio-β-diketonates

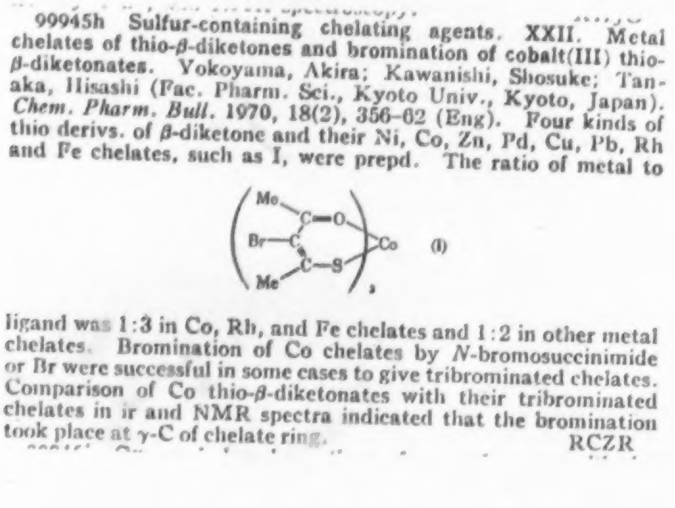
AKIRA YOKOYAMA, SHOSUKE KAWANISHI and HISASHI TANAKA

Faculty of Pharmaceutical Sciences, Kyoto University[2]

(Received October 6, 1969)

Four kinds of thio derivatives of β-diketone and their nickel, cobalt, zinc, palladium, copper, lead, rhodium and iron chelates were prepared. The ratio of metal to ligand was 1:3 in cobalt, rhodium and iron chelates and 1:2 in other metal chelates. Bromination of cobalt chelates by N-bromosuccinimide or bromine were successful in some cases to give tribrominated chelates. Comparison of cobalt thio-β-diketonates with their tribrominated chelates in infrared and nuclear magnetic resonance spectra indicated that the bromination took place at γ-carbon of chelate ring. The success of the bromination can be considered as a kind of support for quasiaromaticity of the chelate to some extent.

It is a problem of great interest to vary the ligand atom of previously known chelating agents keeping their basic structures, because it will cause a great change of property in the chelate formation. Especially, replacing the oxygen atom by the sulfur atom would give rise to the great change of the selectivity of the chelating agents and the stability of the metal



99945h **Sulfur-containing chelating agents. XXII. Metal chelates of thio-β-diketones and bromination of cobalt(III) thio-β-diketonates.** Yokoyama, Akira; Kawanishi, Shosuke; Tanaka, Hisashi (Fac. Pharm. Sci., Kyoto Univ., Kyoto, Japan). *Chem. Pharm. Bull.* 1970, 18(2), 356–62 (Eng). Four kinds of thio derivs. of β-diketone and their Ni, Co, Zn, Pd, Cu, Pb, Rh and Fe chelates, such as I, were prepd. The ratio of metal to

(I)

ligand was 1:3 in Co, Rh, and Fe chelates and 1:2 in other metal chelates. Bromination of Co chelates by N-bromosuccinimide or Br were successful in some cases to give tribrominated chelates. Comparison of Co thio-β-diketonates with their tribrominated chelates in ir and NMR spectra indicated that the bromination took place at γ-C of chelate ring.
RCZR

(Author's synopsis taken from the Chemical and Pharmaceutical Bulletin published by the Pharmaceutical Society of Japan, and the abstract taken from the Chemical Abstracts published by the American Chemical Society)

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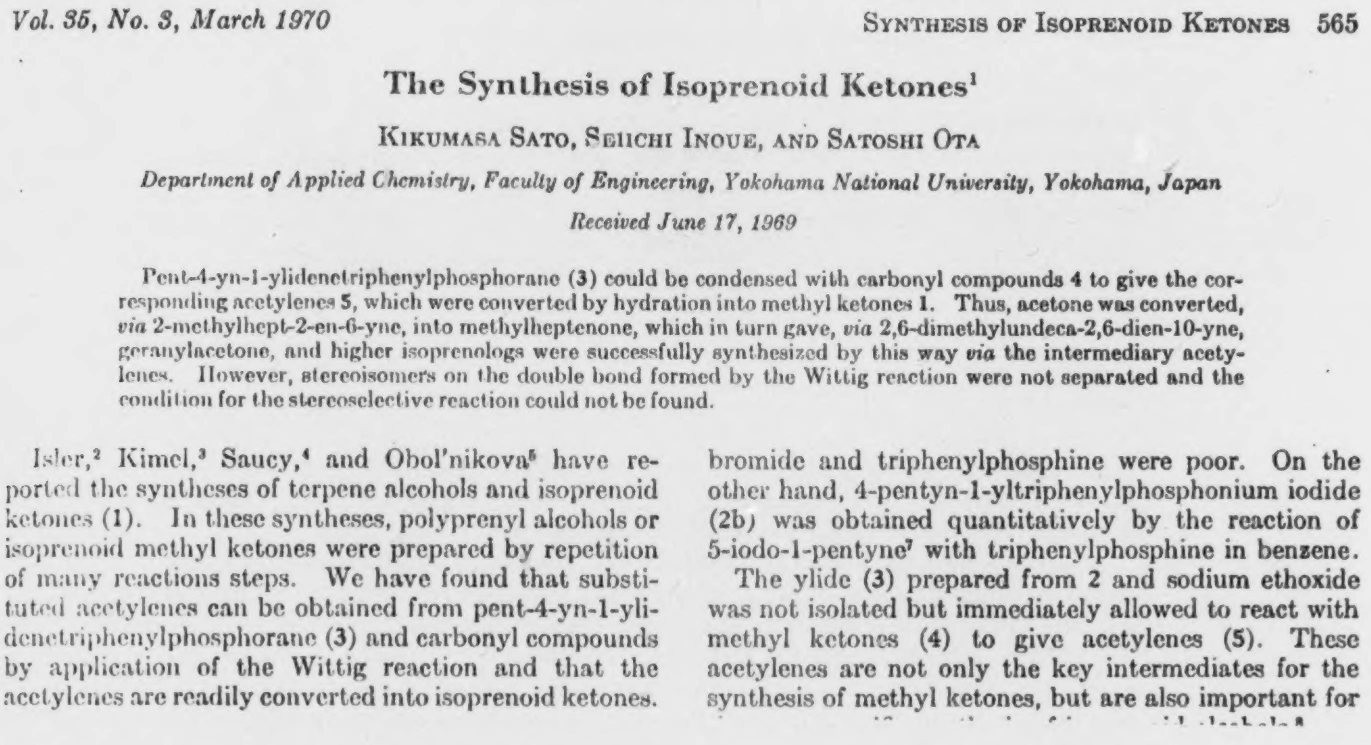
Fig. 6. Example of Author's Synopsis and Objective Abstract



Vol. 35, No. 3, March 1970 SYNTHESIS OF ISOPRENOID KETONES 565

The Synthesis of Isoprenoid Ketones[1]

KIKUMASA SATO, SEIICHI INOUE, AND SATOSHI OTA

Department of Applied Chemistry, Faculty of Engineering, Yokohama National University, Yokohama, Japan

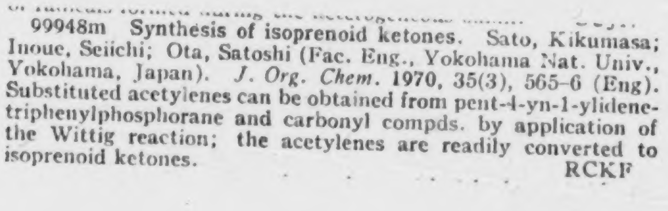
Received June 17, 1969

Pent-4-yn-1-ylidenetriphenylphosphorane (3) could be condensed with carbonyl compounds 4 to give the corresponding acetylenes 5, which were converted by hydration into methyl ketones 1. Thus, acetone was converted, *via* 2-methylhept-2-en-6-yne, into methylheptenone, which in turn gave, *via* 2,6-dimethylundeca-2,6-dien-10-yne, geranylacetone, and higher isoprenologs were successfully synthesized by this way *via* the intermediary acetylenes. However, stereoisomers on the double bond formed by the Wittig reaction were not separated and the condition for the stereoselective reaction could not be found.

Isler,[2] Kimel,[3] Saucy,[4] and Obol'nikova[5] have reported the syntheses of terpene alcohols and isoprenoid ketones (1). In these syntheses, polyprenyl alcohols or isoprenoid methyl ketones were prepared by repetition of many reactions steps. We have found that substituted acetylenes can be obtained from pent-4-yn-1-ylidenetriphenylphosphorane (3) and carbonyl compounds by application of the Wittig reaction and that the acetylenes are readily converted into isoprenoid ketones.

bromide and triphenylphosphine were poor. On the other hand, 4-pentyn-1-yltriphenylphosphonium iodide (2b) was obtained quantitatively by the reaction of 5-iodo-1-pentyne[7] with triphenylphosphine in benzene.

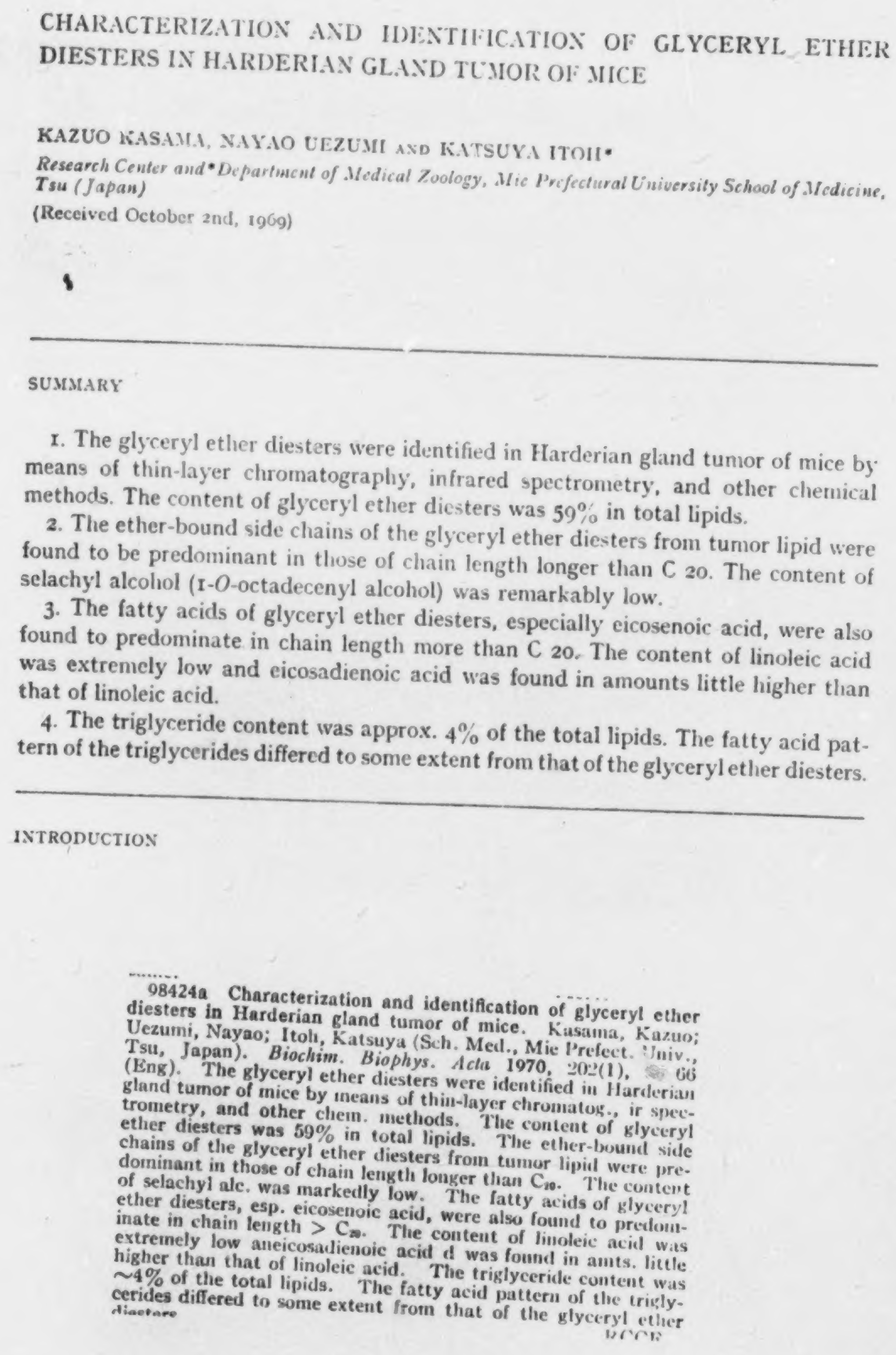
The ylide (3) prepared from 2 and sodium ethoxide was not isolated but immediately allowed to react with methyl ketones (4) to give acetylenes (5). These acetylenes are not only the key intermediates for the synthesis of methyl ketones, but are also important for



99948m Synthesis of isoprenoid ketones. Sato, Kikumasa; Inoue, Seiichi; Ota, Satoshi (Fac. Eng., Yokohama Nat. Univ., Yokohama, Japan). *J. Org. Chem.* 1970, 35(3), 565-6 (Eng). Substituted acetylenes can be obtained from pent-4-yn-1-ylidenetriphenylphosphorane and carbonyl compds. by application of the Wittig reaction; the acetylenes are readily converted to isoprenoid ketones. RCKF

(Author's synopsis taken from the Journal of Organic Chemistry published by the American Chemical Society, and the abstract taken from the Chemical Abstracts)

Fig. 7. Example of Author's Summary and Objective Abstract



CHARACTERIZATION AND IDENTIFICATION OF GLYCERYL ETHER DIESTERS IN HARDERIAN GLAND TUMOR OF MICE

KAZUO KASAMA, NAYAO UEZUMI AND KATSUYA ITOH*
*Research Center and *Department of Medical Zoology, Mie Prefectural University School of Medicine, Tsu (Japan)*

(Received October 2nd, 1969)

SUMMARY

1. The glyceryl ether diesters were identified in Harderian gland tumor of mice by means of thin-layer chromatography, infrared spectrometry, and other chemical methods. The content of glyceryl ether diesters was 59% in total lipids.

2. The ether-bound side chains of the glyceryl ether diesters from tumor lipid were found to be predominant in those of chain length longer than C 20. The content of selachyl alcohol (1-*O*-octadecenyl alcohol) was remarkably low.

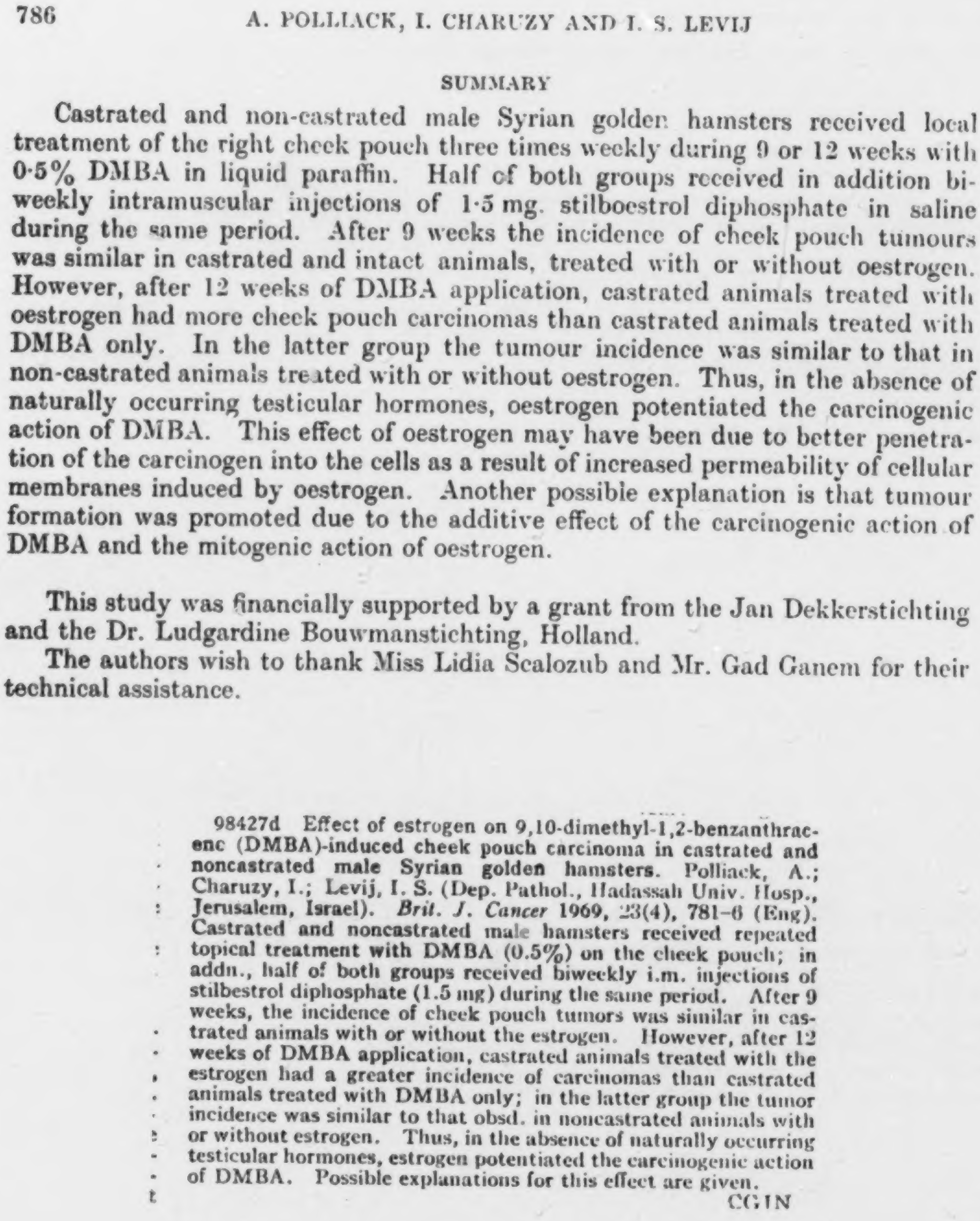
3. The fatty acids of glyceryl ether diesters, especially eicosenoic acid, were also found to predominate in chain length more than C 20. The content of linoleic acid was extremely low and eicosadienoic acid was found in amounts little higher than that of linoleic acid.

4. The triglyceride content was approx. 4% of the total lipids. The fatty acid pattern of the triglycerides differed to some extent from that of the glyceryl ether diesters.

INTRODUCTION

98424a Characterization and identification of glyceryl ether
diesters in Harderian gland tumor of mice. Kasama, Kazuo;
Uezumi, Nayao; Itoh, Katsuya (Sch. Med., Mie Prefect. Univ.,
Tsu, Japan). *Biochim. Biophys. Acta* 1970, 202(1), 66
(Eng). The glyceryl ether diesters were identified in Harderian
gland tumor of mice by means of thin-layer chromatog., ir spec-
trometry, and other chem. methods. The content of glyceryl
ether diesters was 59% in total lipids. The ether-bound side
chains of the glyceryl ether diesters from tumor lipid were pre-
dominant in those of chain length longer than C_{20}. The content
of selachyl alc. was markedly low. The fatty acids of glyceryl
ether diesters, esp. eicosenoic acid, were also found to predom-
inate in chain length > C_{20}. The content of linoleic acid was
extremely low aneicosadienoic acid d was found in amts. little
higher than that of linoleic acid. The triglyceride content was
~4% of the total lipids. The fatty acid pattern of the trigly-
cerides differed to some extent from that of the glyceryl ether
diesters
RCCR

(Author's summary taken from Biochimica et Biophysica Acta published by the Elsevier Publishing Company, Amsterdam, and abstract taken from the Chemical Abstracts) x Fig. 8. Example of Author's Summary and Objective Abstract



SUMMARY

Castrated and non-castrated male Syrian golden hamsters received local treatment of the right cheek pouch three times weekly during 9 or 12 weeks with 0·5% DMBA in liquid paraffin. Half of both groups received in addition bi-weekly intramuscular injections of 1·5 mg. stilboestrol diphosphate in saline during the same period. After 9 weeks the incidence of cheek pouch tumours was similar in castrated and intact animals, treated with or without oestrogen. However, after 12 weeks of DMBA application, castrated animals treated with oestrogen had more cheek pouch carcinomas than castrated animals treated with DMBA only. In the latter group the tumour incidence was similar to that in non-castrated animals treated with or without oestrogen. Thus, in the absence of naturally occurring testicular hormones, oestrogen potentiated the carcinogenic action of DMBA. This effect of oestrogen may have been due to better penetration of the carcinogen into the cells as a result of increased permeability of cellular membranes induced by oestrogen. Another possible explanation is that tumour formation was promoted due to the additive effect of the carcinogenic action of DMBA and the mitogenic action of oestrogen.

This study was financially supported by a grant from the Jan Dekkerstichting and the Dr. Ludgardine Bouwmanstichting, Holland.

The authors wish to thank Miss Lidia Scalozub and Mr. Gad Ganem for their technical assistance.

98427d **Effect of estrogen on 9,10-dimethyl-1,2-benzanthracene (DMBA)-induced cheek pouch carcinoma in castrated and noncastrated male Syrian golden hamsters.** Polliack, A.; Charuzy, I.; Levij, I. S. (Dep. Pathol., Hadassah Univ. Hosp., Jerusalem, Israel). *Brit. J. Cancer* 1969, 23(4), 781–6 (Eng). Castrated and noncastrated male hamsters received repeated topical treatment with DMBA (0.5%) on the cheek pouch; in addn., half of both groups received biweekly i.m. injections of stilbestrol diphosphate (1.5 mg) during the same period. After 9 weeks, the incidence of cheek pouch tumors was similar in castrated animals with or without the estrogen. However, after 12 weeks of DMBA application, castrated animals treated with the estrogen had a greater incidence of carcinomas than castrated animals treated with DMBA only; in the latter group the tumor incidence was similar to that obsd. in noncastrated animals with or without estrogen. Thus, in the absence of naturally occurring testicular hormones, estrogen potentiated the carcinogenic action of DMBA. Possible explanations for this effect are given.

CGIN

(Author's summary taken from the British Journal of Cancer published by Lewis and Company, and abstract taken from Chemical Abstracts)

Fig. 9. Examples of Author's Abstract and Objective Abstract

84. UDC 616-006-092.18[616.311]

Cytology and Enzyme Histochemistry of Squamous Carcinoma of the Hamstar Cheek Pouch and Human Oral Mucosa

Ryuichi OKA (*Dept. Oral Surg., Osaka Univ. Dent. Sch. 32 Jôan-cho, Kita-ku, Osaka 530*)

GANN 60(6) 631～648 (1969)

Cytological, histological, and histochemical observations were made on exfoliated cells and tissue sections from hamster cheek pouch mucosa during experimental carcinogenesis. Human oral carcinomas were also investigated in the same manner. The diagnostic value for the application of enzyme histochemistry to exfoliated cells was discussed.

大阪市北区常安町 32 大阪大学歯学部第二口腔外科 岡 隆一
〒530

98438h Cytology and enzyme histochemistry of squamous carcinoma of the hamster cheek pouch and human oral mucosa. Oka, Ryuichi (Dent. Sch., Osaka Univ., Osaka, Japan). *Gann* 1969, 60(6), 631–48 (Eng). Exfoliated cells and sections from hamster cheek pouch mucosa were studied histochem. and compared at various stages during exptl. carcinogenesis. Cytol. and histochem. observation of exfoliated cells from human oral mucosa, normal as well as carcinomatous, was also carried out. Comparison of the enzymic staining reaction in hamster cheek pouch mucosa with that in human oral mucosa showed no particular variations in normal and carcinomatous conditions. Smeared malignant cells had a tendency to show neg. alk. phosphatase, weak nonspecific esterase, and intense lactate, malate, and glucose-6-phosphate dehydrogenase activities. This combination proved to be of value in diagnosis of carcinoma, while acid phosphatase and succinate dehydrogenase were less useful. In the case of esterase, and lactate and malate dehydrogenases, the percentage distribution in exfoliated cells also appeared to be of value in diagnosis of tumors. Norman H. Grant

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87. UDC 616.381-003.217-006-033.3 :547.455.6

Glucose-induced pH Changes in Ehrlich Ascites Tumor Cells

Carl P. SAHLER (*Roswell Park Memorial Inst. Buffalo, New York 14203, U.S.A.*)

GANN 60(6) 657～660 (1969)

Ehrlich ascites tumor cells were incubated with glucose or fructose in saline for 1 hour at 37° without shaking. The final pH of the local extracellular fluid was calculated to be between 4.21 and 4.50. Nonglycolytic sugars did not lower pH. Decreased pH is discussed as a factor in glucose-induced loss of tumor cell transplantability.

98439j Glucose-induced pH changes in Ehrlich ascites tumor cells. Sahler, Carl P. (Roswell Park Mem. Inst., Buffalo, N.Y.). *Gann* 1969, 60(6), 657-60 (Eng). pH decreases during incubation with the glycolytic sugars, glucose and fructose (from pH 6.6 to pH 5.4), were much greater than those obsd. with nonglycolytic ribose or sucrose (to pH 6.3) or with no sugar (to pH 6.2). More striking, however, was the much lower pH obsd. in the cell suspension as compared to that of the supernatant after incubation of cells with glucose and fructose. The pH changes of the local extracellular fluid and intracellular environment were actually much greater than indicated previously. A primary cause for the carcinostatic effect of glucose on Ehrlich ascites tumor cells was the marked lowering of local cellular pH.
Norman H. Grant

(Authors' abstracts from GANN, published by the Japanese Cancer Association, Tokyo, and abstracts from the Chemical Abstracts)

ISO Recommendation R 214 November 1961

ABSTRACTS and SYNOPSES

ABSTRACTS

1. DEFINITION

An abstract is a brief indication of the content of an article or other work, is issued independently of it and includes the appropriate bibliographical reference (see section 4). It is usually compiled by a person other than the author, though it may be based on the (author's) synopsis which accompanies the article or work.

2. PURPOSE, CHARACTER AND CONTENT

An abstract should set out the essential features of the original article or work, indicating new observations and any conclusions drawn from them, so that the reader can decide whether or not he need consult the original. When the original is not readily available, the abstract may be comprehensive enough to serve as a substitute for the reading of the original.

2.1 Normally an abstract should be objective and should respect the general form and balance of the original; the scope and treatment of the subject may be denoted by such terms as "brief", "exhaustive" or "theoretical".

2.2 If designed for a particular group of readers, an abstract may be selective and emphasize certain features of particular interest to them.

2.3 Appraisal or criticism is not the function of an abstract, except of the so-called "critical" abstract, which is, in effect, a critical review in the guise of an abstract. If any matter critical of the original article or work is included, this should be clearly distinguished from the rest of the abstract.

SYNOPSES

1. DEFINITION

A synopsis is a summary of the content of an article or other work, which it always accompanies, preferably between the heading and the text, to distinguish it from any summary of conclusions in the text itself. It is compiled by the author or with his agreement.

2. PURPOSE, CHARACTER AND CONTENT

A synopsis should set out the essential features of the article or work it accompanies, indicating new observations and any conclusions drawn from them, so that the reader can decide whether or not the contents are of sufficient interest or importance to warrant his reading the full text.

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3. PHRASING

An *abstract* should be intelligible in itself, without necessitating reference to the original article or work. It is preferable to use complete sentences rather than a bare list of section headings.

Drawings and diagrams may be reproduced.

3.1 Abbreviations and symbols

Abbreviations and contractions other than those in accepted international usage should be avoided; special symbols, when essential, should be limited to those used and explained in the abstracting journal or service.

3.2 The first sentence should not reproduce the title, but should indicate the subject treated, if this is not clear from the title.

4. BIBLIOGRAPHICAL REFERENCE

The bibliographical reference should precede the text of the abstract, and conform to the requirements of ISO Recommendations R 77 — *Bibliographical References. Essential Elements* and R 4 — *International Code for the Abbreviation of Titles of Periodicals.*

5. TYPE AREA

To permit mounting on standard index cards, the width of the type area should not exceed 103 mm.

3. PHRASING

A *synopsis* should be intelligible in itself without necessitating reference to the article it accompanies.

It is preferable to use complete sentences rather than a bare list of section headings.

3.1 Abbreviations and symbols

Abbreviations and contractions other than those in accepted international usage should be avoided; special symbols, when essential, should be limited to those used and explained in the text.

3.2 Any reference to the author should be in the third person.

4. TRANSLATION

If the language of the original is not one of those widely used internationally, and the original itself is not provided with a translation (full or abridged), a translation of the synopsis in at least one such language should be given.

5. USE OF SYNOPSIS AS BASIS FOR ABSTRACTS

In certain cases, a synopsis which conforms to the foregoing requirements can, with the addition of a bibliographical reference, be used as an abstract.

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AN ANOMALOUS REACTION IN BROMINATION OF 2-BENZYLAMINO-1-BUTANOL

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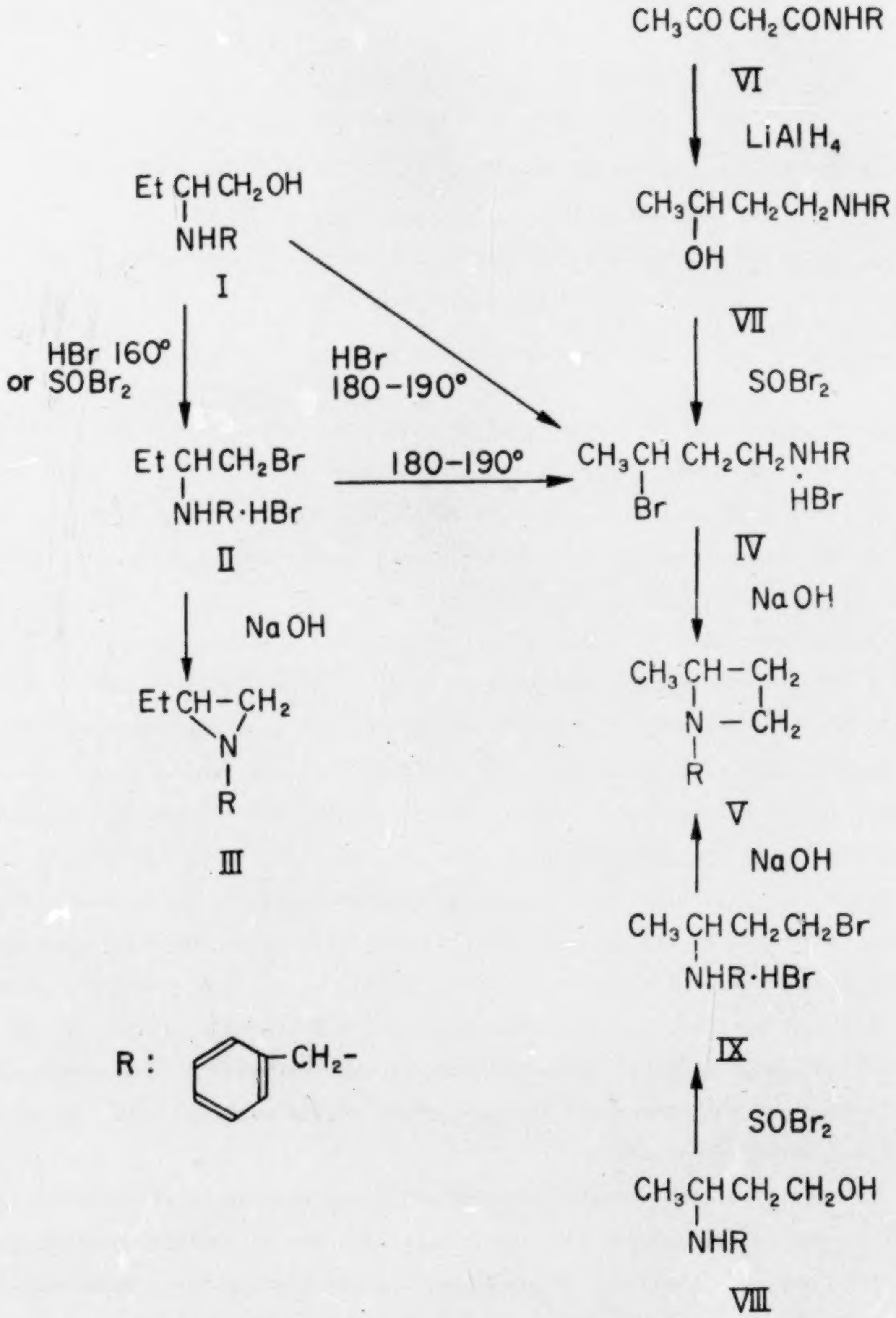
(Received in Japan 21 July 1969; received in UK for publication 20 August 1969)

We wish to report an anomalous reaction of 2-benzylamino-1-butanol (I) with HBr whereby I can be converted into 1-benzylamino-3-bromobutane hydrobromide (IV).

The conversion of β-amino alcohols to β-haloamines followed by base-catalyzed cyclization (Gabriel synthesis) constitutes one of a more useful routes to aziridines. A possible modification of the Gabriel synthesis consists of the reaction of amino alcohol with HBr. Heating of optically active I (Ia, mp 74-75°, $[\alpha]_D^{15}$ + 26.60° (c 1.015, EtOH); Ia-HBr, mp 135-136°, $[\alpha]_{300}^{25}$ + 12.4° (c 1.129, EtOH)) with 48% HBr at 160° by the modified procedure of Cortese (1) gave the expected corresponding product (IIa) (mp 122-123°, $[\alpha]_D^{20}$ + 22.07° (c 1.495, EtOH)) in 22% yield. A mixture of Ia and HBr was heated under reflux and the water formed was distilled through a fractionation column. In this reaction, when the final heating was carried out until the temperature of the content reached 180-190°, an abnormal product, mp 223-225°, which had no optical rotation, was obtained exclusively in 46% yield. Reaction of the racemate of I (Ib, mp 59-60°; Ib-HCl, mp 125-126°) with HBr under the same condition yielded a product identical with the abnormal product in 38% yield, mixed mp 224°. A cyclic amine produced by the treatment of this compound with alkali also did not correspond to the desired aziridine (III), even by variation of the reaction condition.

The NMR spectra of the abnormal product and the cyclic amine showed a doublet assignable to the methyl group. This means that they do not contain an ethyl group in their structure as a result of rearrangement during bromination. Their elemental analytical values and molecular weight were consistent with those of the expected compounds, II and III, but their spectral evidences suggested that their structures were different from II and III. This result, their mode of formation,


CH3CO CH2CONHR
VI
LiAlH4
Et CH CH2OH
NHR
I
CH3CH CH2CH2NHR
OH
VII
HBr 160°
or SOBr2
HBr
180-190°
SOBr2
Et CH CH2Br
NHR·HBr
II
180-190°
CH3CH CH2CH2NHR
Br
HBr
IV
NaOH
NaOH
EtCH-CH2
N
R
III
CH3CH-CH2
N - CH2
R
V
NaOH
CH3CH CH2CH2Br
NHR·HBr
IX
R :
CH2-
SOBr2
CH3CH CH2 CH2OH
NHR
VIII

38. UDC 616-006-092 :612.351.11

High Glutathionase Activity in "Minimum Deviation" Reuber Hepatoma H-139

Silvio FIALA (*Cell Physiol. Lab., Veterans Admin. Hosp. 13000 Sayre St., San Fernando, Calif. 91342, U.S.A.*) and Melvin D. REUBER (*Lab. Biol., Natl. Cancer Inst., NIH, Bldg. 37, Bethesda, Md. 20014, U.S.A.*)

GANN 61(3) 275~278 (1970)

Glutathionase (γ-glutamyl transpeptidase) in Reuber hepatoma H-139 has the activity 40~50 times higher than in normal adult rat liver. High glutathionase activities were found in four other types of transplantable hepatomas and also in neonatal rat liver.

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39. UDC 576.858.6.097

An Immunoferritin Study of a Burkitt Lymphoma Cell Line harboring EB Virus Particles

Kenji SUGAWARA and Toyoro OSATO (*Dept. Virol., Cancer Inst., Hokkaido Univ. Sch. Med. Kita-15-jo, Nishi-7-chome, Sapporo, Hokkaido 060*)

GANN 61(3) 279~281 (1970)

EB virus-carrying Burkitt cell line was studied by immunoferritin technique. The viral capsids and the extracellular enveloped particles were heavily labeled. A striking ferritin tag was evident on the surface membranes of the virus-containing cells. The implications of these findings are discussed.

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〒060

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40. UDC 578.083

Direct Isolation of C-Type Particle-harboring Cells from Mouse Embryo in Soft Agar Medium

Yorio HINUMA, Susumu KATAGIRI, Kiyoshi HANAUMI (*Dept. Microbiol., Sch. Dent., Tohoku Univ. Seiryo-machi 2-1, Sendai 980*), and Junji YAMAGUCHI (*Res. Inst. Tuberc., Leprosy and Cancer, Tohoku Univ. Hirose-machi 4-12, Sendai 980*)

GANN 61(3) 283~286 (1970)

In a soft agar medium inoculated with thymic cells from dd mouse embryos, cell colonies were formed. The cells of colony isolates grew continuously *in vitro*, and they carried C-type particles similar to mouse leukemia virus.

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仙台市広瀬町 4-12　東北大学抗酸菌病研究所　山口淳二
〒980

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41. UDC 615.277.4

Leukemogenic and Mammary Tumorigenic Effects of N-Nitrosobutylurea in Mice and Rats

Kenjiro YOKORO, Nobutaka IMAMURA, Shoichi TAKIZAWA, Homi NISHIHARA, and Eimi NISHIHARA (*Dept. Pathol. and Cancer Res., Res. Inst. Nucl. Med. Biol., Hiroshima Univ., Kasumi-cho, Hiroshima 734*)

GANN 61(3) 287~289 (1970)

Leukemia was induced at a high rate by continuous administration of N-nitrosobutylurea, dissolved in drinking water, both in mice and rats. The incubation period was short, and the type of induced leukemia was uniform in each species. The chemical also induced mammary carcinoma in one strain female rats in which no leukemia had occurred. N-Nitrosobutylurea seems to be a unique tool in elucidating the mechanism of leukemogenesis because of its remarkable uniform inductivity and low toxicity.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

LANGUAGE PROBLEMS IN MECHANIZED DOCUMENTATION

by Yukio Nakamura

1. IMPORTANCE OF LANGUAGE PROBLEMS IN DOCUMENTATION

In treating information processing it can generally be said that
#all information processing --merchanized as well as non-merchanized -- is based on natural languages,
#basic tools for mechanized information processing (e.g. theasurus) are relying upon natural languages,
#computer languages(e.g. Cobol) are also based on a certain natural language.

There is, consequently, a tendency to think that all information processing is practically made only with a specific natural language (English) and one should not try to use other natural languages as the base of processing.

One of the purpose of this paper is to show you that this conclusion is not adequate. Every country can use their own language as the basis of information processing provided that they give a certain amount of effort.

2. TECHNICAL MEANS FOR HANDLING NON=ROMAN ALPHABETS

Some people think that advanced technical means can only be used with Roman alphabet. In fact, it is not.

a) Telegraphy and Typewriters

The tradional telegraphy based on Roman alphabet uses 5-unit, 5 bit or 5-level code (see Fig. 1). These codes are composed of 5 bits or binary signals (i.e.,0 or 1). This permits the use of only 32 (=25) different kind of characters. The ordinary telegraphic apparatus uses this kind of code with a shift key. The total number of characters possible to use is 52 excluding codes necessary for shift and other mechanical actions. The Fig. 1 shows that 58 different characters or actions are actually used.

It is true that other alphabetical system with more than 26 characters can not be applicable to this code system. But, remember, this statement is only true with 5-bit code system.

In Japan where at least 46 characters and 2 supplementary signs are necessary to represent the language, this 5-bit code system is not applicable. Instead, 6-bit code system is used extensively. This code system permits us to represent "Kana" letters (46 + 2), numerals (10) and Roman alphabet (26) with ordinary keyboard equipped with two kinds of shift keys (middle and upper shift). Without shift key we can handle $2^6 = 64$ different kind of characters but with two shift keys, the number increases up to $3x64 - 2 = 190$. Taking account of the parallel use of Roman letters (26), numerals (10) and punctuation signs (maximum 10), the maximum number is $190 - 26 - 10 - 10 = 150$, being enough for most languages.

The 6-bit telegraphic system is developed and used extensively in Japan. The same typewriter (terminal equipment for telegraphy) is used in telex and input-output devices of computers. We can find further the cases of application to several languages of Asia. Other languages to which 6-unit system is actually applied is Korean, Burmese, Ceylonese and Thai language.

b) Coding of Characters other than usual Roman alphabet

In computers where more signs (e.g.,*,+,&, , etc., about 20 in number) are needed than in telegraphy and the misprinting is not tolerated, the use of 5-unit code is impossible, then 6-unit code becomes of necessity. However to prebent the possible misprinting the use of another bit, called parity check bit, is necessary. For this reason 7-unit or 7-bit code is much used (see Fig. 2 Table).

Until now, in computers, the exclusive use of upper-case letters or capitals were inevitable in most computers due to economic reason. However with the development of photosetting machine or other machines using computer-based printing technique, the use of both upper and lower case letters has become possible, at first, and it is now changing to a matter of necessity to use both kind of letters to give satisfaction to users. The use of both cases necessitate the use of 7-bit code apart from the parity check bit. (If parity check bit is used, 8 bits are required).

In most European languages, 26 alphabets are not enough and they use diacritical signs or other supplementary signs over normalalphabets. For instance German uses of diacritical signs " and special letter French uses four kind of diacritical signs (´, `, ^, " and another sign below a letter) and a composite letter oe.

In telegraphy, where only capital letters are used, most of the diacritical signs are neglected and special letters are replaced by some combination of ordinary letter, e.g. in German, ö by OE,by ß SS and in French é è, ê and ë are all written simply as E, oe is replaced by OE etc.

Even with this 7-bit code the use of diacritical signs and special letters is impossible. To make the use of these possible, the addition of another bit is inebitable. It is desirable that these 6-bit, 7-bit and 8-bit codes are compatible each other. TheASII code system, proposed by US, is a good example of codes compatible through 6-bit, 7-bit and 8-bit systems (see Fig. 3).

c) Chinese Characters

Chinese character is famous for its abundance in the number of characters and it is, therefore, the most difficult to handle in machines. If we want to be comprehensive, about 50,000 characters are needed, however the limitation of the number of characters is considered necessary and, in Japan, the authorized "Everyday-life characters" numbers to some 1,800.

Typewriters for Chinese characters exist in Japan. It is in use in every office in Japan provided that the manipulation requires exercise of certain amount and that the speed of printing is considerably low (30 characters maximum a minute). The teletypewriters for Chinese characters also exist. To handle some 2,000 - 2,500 characters it is necessary to use 12-bit codes (since $2^{12} = 4,096$). Since 6-bit codes are widely used in telegraphy in Japan, 12-bit code is conveniently formed by two rows of 6-bit codes.

Recent computer output devices designed for Chinese characters comprise high-speed electrostatic printer (mostly dot-type printer) and cathoderay display equipment. For both apparatus input operation is made through a large keyboard which requires much experience. (Input device of this kind will be shown in JICST during your technical visit)

3. USE OF DUPLICATING MACHINES VS. TYPEWRITERS

The use of duplicating machines in Japan is specially extensive. You will see a duplicating machine in each office room in Japan. But if you look at the same room carefully you will find no typewriter there. Of course Japanese typewriters for Chinese characters and those for kana-letters do exist (see Chapter 2 above), but the manipulation of these machines require considerable training, the usual clerks do not use typewriters but they use duplicating machine with carefully handwritten drafts.

This phenomenon shows the difference in the use of machines by alphabet system. In countries where the use of typewriters is difficult or at least awkward, the extensive use of duplicating machine is recommended. For this matter Japan is well experienced.

The same tendency can be seen in the telecommunication technique. For non-Roman alphabet countries, the use of facsimile is quite desirable. In Western countries facsimile is regarded as the means for transmitting charts, graphs etc., but it is also adequate for the communication in natural language and we have evidence that it is sometimes more economical than typewriter-based telegraphy.

4. THESAURUS IN NON-WESTERN LANGUAGES

Until now most of the famous thesauri are compiled in English. There are, of course, thesauri in other Western languages; it is, however, quite rare to see a comprehensive thesaurus such as that of EJC in non-Englsh languages.

In Japan there are many single discipline-oriented thesauri for in-house use. JICST has compiled several such thesauri for experimental use but these are not yet published for public use. These thesauri are in Japanese and more specifically, in Japanese written by kana-letters except for some special cases (e.g.botanical names) where Roman alphabet is used. The structure of these thesauri conforms, in princile, to the rules suggested by the Thesaurus Rules and Convention (1966) by EJC.

The Science and Technology Agency of Japanese Government is now trying to compile a Japanese thesaurus which they intend to use as standardized one, based on the translation of EJC Thesaurus. Of course one-to-one correspondence between English and Japanese descriptors is not possible, it is, therefore, to be considered different publication and they do not intend to give any serious concordance with the EJC Thesaurus.

5. TRANSLITERATION PROBLEMS

The use of each nation's mother tongue for information processing is possible and even desirable, however this does not mean that the transliteration is a minor problem. Whenever we compile an index or other bibliographical tools we are forced to transliterate words in character system A into corresponding words in character system B.

When the transliteration is made arbitrarily, the identification of words, especially of individual name becomes difficult. The famous Russian author Yexob has been transliterated as Chekhov in English, Tchekhoff in French, Tschechoff in German and Čehov in Czech. How a documentalist or librarian can be sure that these different names are attribted to a single author in compiling an index or a catalog. We hope to have a single or a few standardized way of transliteration from Cyrilic to Roman alphabet.

This work has been undertaken by ISO. The ISO Recommendation has told us this Russian author shall be spelled as Čhehov. However, British and American standardization organizations do not agree to this way, they rather prefer the spelling Chekhov, mainly to avoid the use of diacritical signs. World-wide standardization is desirable but if it is difficult, we must satisfy with two alternatives.

There are many languages with their own alphabet in which the transliteration to other alphabet system (mainly to Roman alphabet) is quite arbitrary. We do hope that the standardization will be made in such cases. The main responsible international organization is ISO (International Organization for Standardization).

		1	2	3	4	5
A	-	o	o			
B	?	o			o	o
C	:	o		o	o	
D	$	o		o		
E	3	o				
F	#	o		o	o	
G	&		o		o	o
H	£			o		o
I	8		o	o		
J	BELL	o	o		o	
K	(	o	o	o	o	
L	)		o			o
M	.			o	o	o
N	,			o	o	
O	9				o	o
P	0		o	o		o
Q	1	o	o	o		
R	4		o		o	
S	'	o		o		
T	5					o
U	7	o	o	o		
V	;		o	o	o	o
W	2	o	o			o
X	/	o		o	o	o
Y	6	o		o		o
Z	"	o				o
SPACE				o		
FIGS		o	o		o	o
LETTERS		o	o	o	o	o
L FEED			o			
C RETURN					o	
BLAND						

Fig. 1

USE OF PARITY BIT

Channel		Characters
Name	Number	) * 8 B X
Parity-bit channel	7	0 0 1 1 0
Zone-channels	6	0 0 0 1 1
	5	0 0 1 0 1
	4	0 1 1 0 0
Numerical channel	3	1 1 0 0 1
	2	0 0 1 0 1
	1	0 1 1 1 1
Number of bits		1 3 5 3 5

Fig. 2

EXTENDED ASCII (8-bit code)

	6-bit code	7-bit code	8-bit code
A	0001 01	0001 001	0001 0010
B	0010 01	0010 001	0010 0010
C	0011 01	0011 001	0011 0010
⋮	⋮	⋮	⋮
P	0000 11	0000 101	0000 1010
Q	0001 11	0001 101	0001 1010
R	0010 11	0010 101	0010 1010
S	0011 11	0011 101	0011 1010
⋮	⋮	⋮	⋮
a		0001 011	0001 0110
b		0010 011	0010 0110
c		0011 011	0011 0110
⋮		⋮	⋮
p		0000 111	0000 1110
q		0001 111	0001 1110
r		0010 111	0010 1110
s		0011 111	0011 1110
⋮		⋮	⋮
Ł			0001 0101
Ø			0010 0101
Đ			0010 0101
Þ			0011 0101
⋮			
`			0001 0111
´			0010 0111
⋮			⋮

Fig.3

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Tokyo, 20 July - 21 August 1970

INDEXING AND FILE ORGANIZATION

Yukio NAKAMURA

1. INTRODUCTION

It has been shown in the previous divisions that we can organize computer files as indexes in the traditional sense. This index can be used almost in the same way -- and sometimes more profitably--as those prepared and used manually.

However, there are also indexes which can be furnished by computers in different way from those prepared and used manually. That is to say, a computer can perform many action which is practically impossible to perform if we only have manual processes.

For instance, we can prepare an index in book form once a year using conventional method. But it is practically impossible to revise an index weekly. However, this can be done by a computerized system without inhibitive cost.

These cases show that computer can perform profitably the action which is impossible by manual operations since it takes too much time and cost to perform. Computer is a servant for men who is very rapid and diligent in action, and never blames the burden of work to do. This is one of the characteristic of computerized system.

There is, however, another characteristic of computerized system that computer can not do an action which can be performed manually. This is especially the case for actions such as complicated and subtle decision or temporary case-by-case judgement.

Computer is a servant who observes exactly the instruction given by his master and the computer never tries to make any conjecture. We will examine the performance of computerized information storage and retrieval (ISR) systems and try to find out fundamental characteristics which makes possible the performances.

The Necessity of Clues

In a ISR system we need some kind of clue to represent each document to be stored and later retrieved. This clue is not limited to natural language words -- controlled or uncontrolled -- but it might well be classification numbers or some codes.

This clue must be simpler, in its very nature, than the document itself which the clue represents. Since source documents are, in principle, voluminous, and it takes much time to examine them even by machine, we do not prefer, in most cases, to treat full texts. On the contrary if we can have adequate clues for documents, our processing needs less time and less effort, and, consequently, it becomes practical.

But clues are not necessarily a single word or a combination of a few words but it can be a set of several hundred words (machine words) since existing computers are sufficiently high-speed.

It should be remembered that actual retrieval process is performed, not on source text but on clues, provided clues are adequate to represent source documents.

The difficulty of ISR is that the storage and retrieval process is not handled by a single man. Then the adequateness of clues must be inquired. Man working for storage process (storer) may think a clue a is adequate for a document A which includes concept α. But we are not sure that a man working for retrieval (searcher) may take up a instead of a' or a'' for the same concept. Thus he may give the clue a' as the instruction to machine and the result is that he fails to retrieve document A.

The whole process of ISR is schematically shown in the figure below:

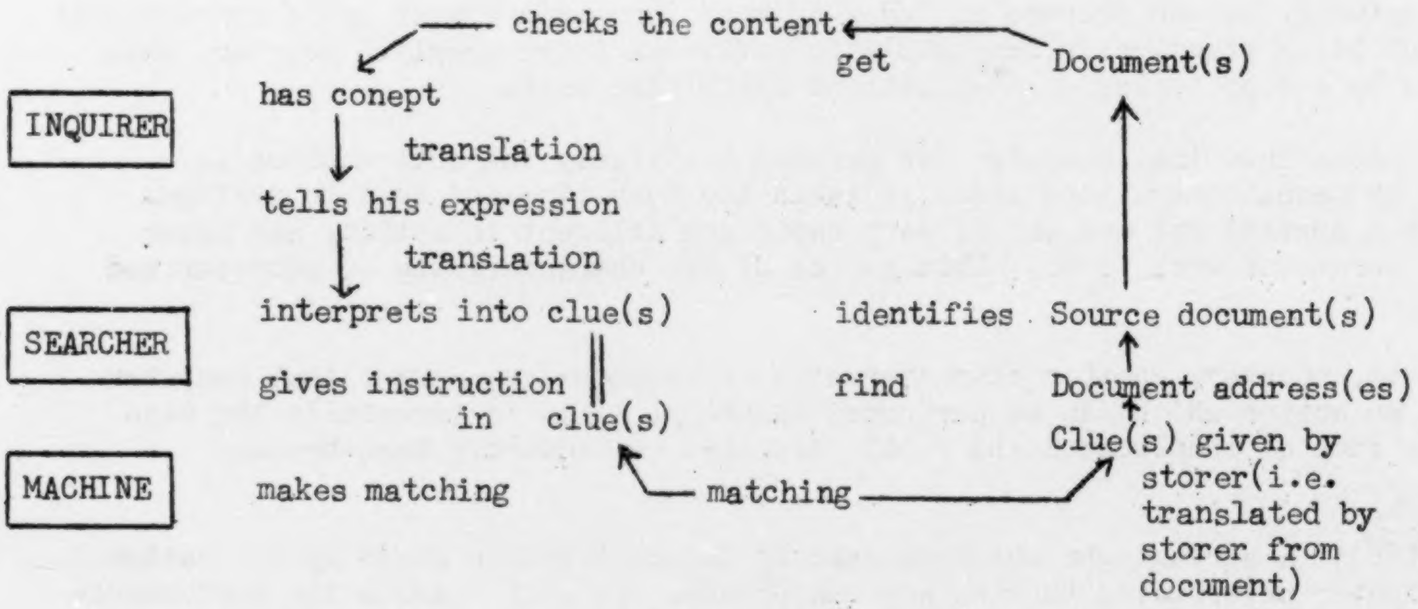
checks the content
get
Document(s)
INQUIRER
has conept
translation
tells his expression
translation
interprets into clue(s)
identifies
Source document(s)
SEARCHER
gives instruction
in clue(s)
find
Document address(es)
Clue(s) given by
storer(i.e.
translated by
storer from
document)
MACHINE
makes matching
matching

Fig. 1

Thus one can say that:

"The ISR is a kind of communication action made through the use of clues between the storer and the searcher of documents. There is an arbitrary time gap between the instants when a document stored and retrieved."

A model is shown in Fig. 2.

It is well expected that the use of clues are not exactly the same between the storers and the searchers. It is also expected that the rule for the choice of clues may differ at the storing and the retrieving moments. Thus a good ISR system must be competent enough to overcome these difficulties.

We will examine, in the following, various means taken for the implementation of this difficult ISR processes.

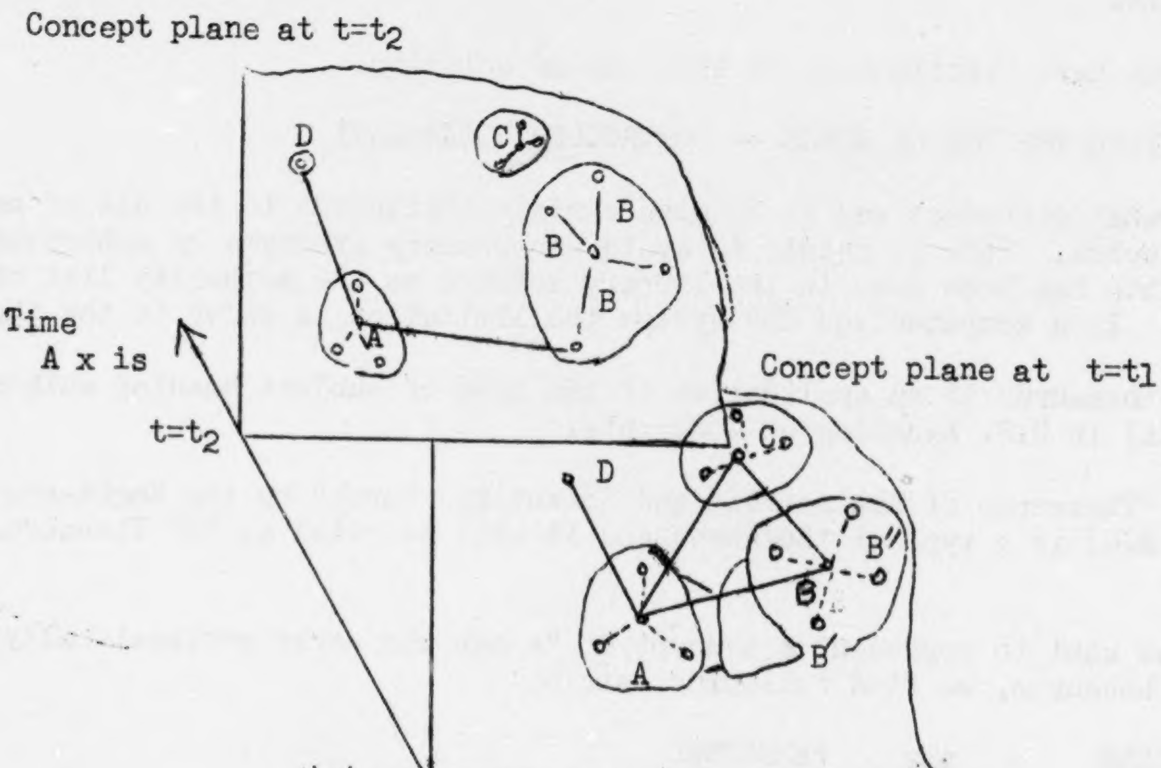
Concept plane at t=t$_2$
D
C
B
B
B
A
Time
A x is
t=t$_2$
Concept plane at t=t$_1$
C
D
B''
B'
B
A
t=t$_1$
Y
Concept plane
t=0
X

Fig. 2. A Model of ISR.

2. LANGUAGE AND MEANING

In most cases our concept is expressed by our natural languages. We do not care for the name of language -- whether it is English or French or any Asian languages -- all natural language has common feature -- sometimes defects -- the ambiguity in meaning. One of the most important effort in ISR is to overcome this difficulty in a practical way.

2.1 GIVING DEFINITION

One can insist that a term can be defined completely by giving rigorous definition and so do we, especially in scientific field. But not all words are so well defined and we always have difficulty in interpreting the real meaning of a phrase. New terms are created day after day without rigorous definition and it is worse that the definition once given changes after the progress of science which is so rapid.

We can have little hope in this way of solution.

2.2 LIMITING THE USE OF WORDS -- CONTROLLED VOCABULARY

Somewhat different way is to give certain limitation to the use of natural language words. This is mainly to avoid unnecessary synonyms or ambiguous use of words. This has been done in the library science as the authority list of subject headings. In a computerized ISR system the limitation is shown in the thesaurus.

The thesaurus is an application of the idea of subject heading authority list, traditional in U.S. handling of documents.

The "Thesaurus of Engineering and Scientific Terms" by the Engineers Joint Council (EJC) is a typical thesaurus and it will be cited as EJC Thesaurus hereinafter.

If we want to represent a concept of "a man who works professionally" and consult the EJC Thesaurus, we find following entries:

WORKERS	use	PERSONNEL
LABORERS	use	UNSKILLED WORKERS

Since there is UNSKILLED WORKERS as authorized word or descriptor one will perhaps try to ascertain if SKILLED WORKERS is an authorized word and this is the case. Now it is clear that PERSONNEL (which is a term broader in meaning than workers or laborers), SKILLED WORKERS and UNSKILLED WORKERS are authorized but single word WORKERS is not.

Since the number of authorized words are rather limited, there are many concepts which can not be expressed directly. In this case, one must satisfy with other authorized words of broader or narrower meaning or by the combination of authorized words. This combination is called coordination.

The idea of descriptors is nothing but the extension of conventional subject headings but when descriptors are used in mechanized systems, they have more advantage than the authority list of subject headings in that it can use logical combination of descriptors.

We understand here that a descriptor A represents a concept. In a file, there is a group of documents which is related to the descriptor A. This group is a subset of the complete file F which is regarded as a set from mathematical point of view, and especially from that of the set theory. We will represent the subset related to the descriptor A by A.

2.3 LOGICAL PRODUCT OR CONJUNCTION

If, for instance, two descriptors are needed to express a concept one must specify which kind of relationship they must have between them. The first combination is logical product.

If the concept one wish to express has to relate to two descriptors A and B at the same time, or in other words, A and B are in separably connected, we say this combination is the logical product or conjunction of A and B. This is represented in logics as $A \wedge B$ and, in programmings, mostly, A * B.

For instance, "Use of radar for the detection of a certain object" needs at least two concepts or words RADAR and DETECTION. The descriptors RADAR representes all aspects of a radar, and the DETECTION represents detection in general. But what we want here is a kind of detection (which is narrower than "detection in general") employing a radar or a kind of the application of radar (narrower than "radar in general") for detection purpose. The combination RADAR ∧ DECTECTION is narrower than each of RADAR and DETECTION. This is shown schematically in Venn's diagram.

If we use the word Detection Radar (if such word is permitted) as a term representing the same meaning as shown above, and if we recognize this new term as a descriptor, and this is possible, it is not necessary to use the combination RADAR ∧ DETECTION.

Note that the sign ∧ or * is often read as "and," but this way of use has rather limited meaning than that in everyday use of words. Note also that the sign: (colon) in UDC is the sign of logical product also.

Now, we will see how these logical products are related to subsets of a file. There is a subset R of documents related to a descriptor RADAR and subset D related to DETECTION. We will suppose, and this is quite possible, that there exists one or more documents which is related at the same time to RADAR and DETECTION. The two subsets R and D have, therefore, a common part. This is schematically shown in Fig. 3.

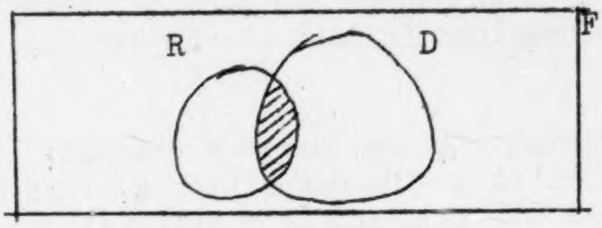

Fig. 3

The common part (shaded in Fig. 3) is called as the intersection of subsets R and D and denoted as $R \cap D$. Now it is clear that the common part corresponds to the answer to be given for the search instruction $\underline{R} \wedge \underline{D}$ (conjunction of $\underline{R}$ and $\underline{D}$). We can say, therefore,

The intersection of a two subsets $R \cap D$ corresponds to the conjunction $R \wedge D$.

2.4 LOGICAL SUM OR DISJUNCTION

The second combination is logical sum or disjunction. This kind of combination is necessary when a clue is needed for the concept, such as "Europe or Asia," or "not only Europe but also Asia" or, in other words, Eurasia (fortunately we have such word). This relation is shown by the sign $\vee$ in logics and in programmings mostly by +. The above example is now represented by EUROPE $\vee$ ASIA or EUROPE * ASIA.

Note that in UDC logical sum is represented by the sign "+" as in programming.

Similar to the case of conjunction or logical product and intersection in a set,

the logical sum or disjunction $R \vee D$ corresponds to the union of subsets R and D which is denoted as R U D.

In Fig. 4, the union of subsets R and D is shown as the white part in the total file F.

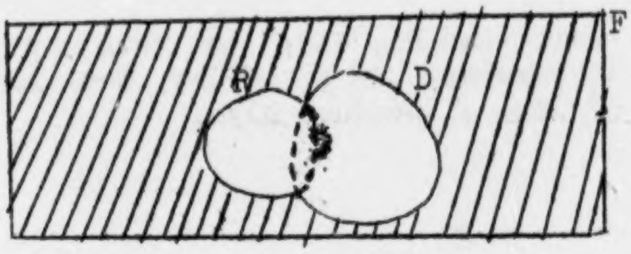

Fig. 4

2.5 NEGATION

In logics negation of A means "not A" and in set theory, if a subset A is given, then the complement of A or $\bar{A}$ is the "all subsets but A." This is shown in Fig. 5 as the shaded area. Thus negation of A corresponds to the complement of A.

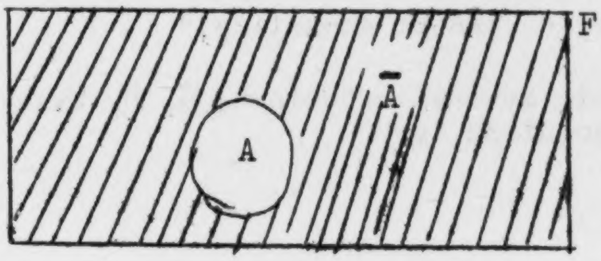

Fig. 5

It is easily seen that following relations are valid.

$$A \cup \bar{A} = F$$

$$\text{negation of } \bar{A} = A \text{ or } A = \bar{\bar{A}}$$

and

$$A \cap \bar{A} = 0$$

since there is no overlapping between the subsets A and $\bar{A}$.

With the use of notations shown above, one can derive several useful relations as shown below:

$$A \quad (B \cup C) = (A \cap B) \cup (A \cap C)$$
$$A \cup (B \cap C) = (A \cup B) \quad (A \cup C)$$
$$(A \cup B) \cap (C \cup D) = (A \cap C) \cup (B \cap C) \cup (A \cap D) \cup (B \cap D)$$

Problem:

Try to find out that $A \cap B = \overline{\bar{A} \cup \bar{B}}$ by Venn diagram.

In a conventional search system negation is seldom used. This does not mean negation is not necessary but this is due to the fact that negation is hard to implement except in aspects cards. On the contrary in computer systems negation is usefully employed.

2.6 LOGICAL DIFFERENCE

This type of combination is regarded as the combination of logical product and negation. In practice it is needed to use when search requires such instruction as:

"Mention all documents on physics except acoustics,"

If a set A is divided into several subsets B, C, D, E...., and the problem is to get all subsets but B, the solution is

$$C \cup D \cup E \cup \ldots$$

which is equal to

$$A \cap \overline{B}.$$

Belating to the practical case shown above, physics is divided, according to UDC, into ten subdivisions (or subsets) as Generalities, Mechanics (of Mass Particle and Rigid Bodies), Mechanics of Fluids, Mechanics of Gases, Acoustics, Optics, Heat, Electricity, Magnetism and Electromagnetism, and Molecular and Atomic Physics. The question "physics except acoustics" can not be explicitely expressed in UDC

The possible answer is

530 + 531 + 532 + 533 + 535 + 536 + 537 + 538 + 539

which can be contracted as

530/533 + 535/539.

In manual search it is of no use to represent logical difference as

53 minus 534 or $53 * \overline{534}$.

3. FILES AND FILE ORGANIZATION

Files for mechanized retrieval is, in principle, not different from conventional files manually operated. But in physical form there is an appreciable difference and we have special terms to identify the construction of mechanized files. The commonest mechanized file is made with a magnetic tape (MT).

3.1 Construction of Data in Magnetic Tape.

Since MT runs at a speed of 75 to 200 inches a second or 1.90 to 5.08 m/s and the read-write process which is extremely fast is made only while the MT tape is in motion, the tape reading or writing speed range from 5,000 to more than

100,000 alphanumerical characters a second. A single reel of MT has, usually, a length of 1,200 or 2,400 feet.

Usually MT's are operated on start-stop basis. A few system work on the continuous run of total length of MT. A special machine will be described later which is based on this exceptional use.

The usual operation of tape is based on start-stop principle. Since the read-write process must be done for the MT running at a definite speed, MT must be in running while read-write process is made. If, on the contrary, read-write instruction is over, the tape handler stops. It is natural that the speed of MT varies while it begins to run and to stop. Read-write process must not be done in this transitory part. To this end, on MT, we have Inter-record gap (IRG) between records or more exactly physical records. The word record is used in two ways in MT. One is the physical record given above and the other is the logical record which has a certain meaning. A physical record may consist of several logical records.

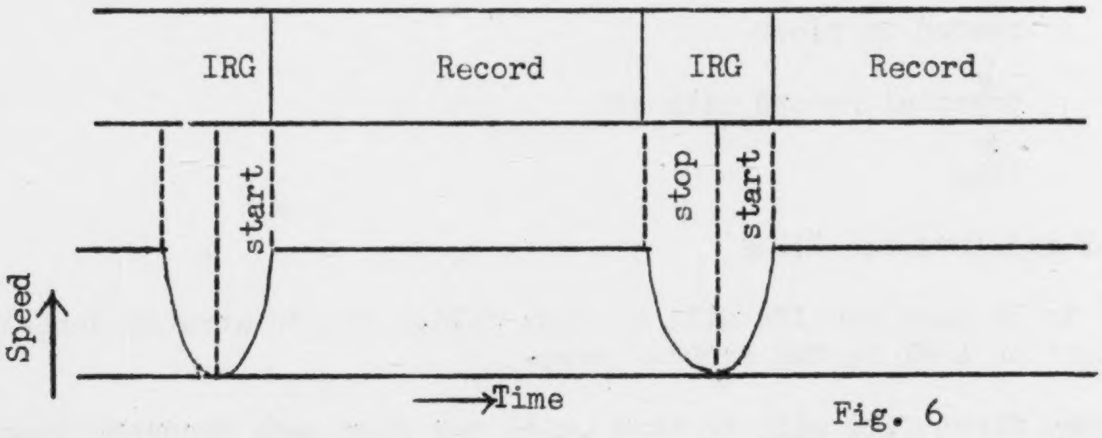

Fig. 6

If a physical record consists of a single logical record, this type of structure is called unblocked record, while a physical record consisted from several logical records is called blocked record. In the latter case, we put a banner to denote the beginning of physical record.

In a computer, one machine word consists of a fixed number of characters (e.g., 12 alphanumeric characters) in the fixed-length word machine. Variable length word machine will be described later. If the data elements are shorter, excess positions are filled with zeros or spaces. On the contrary longer data occupy two or more machine words.

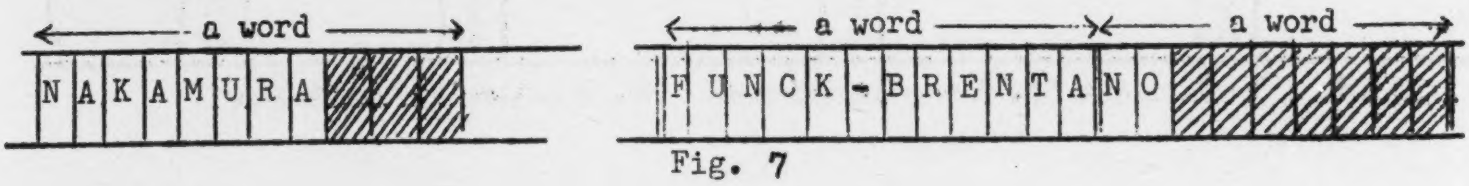

Fig. 7

A fixed number of characters or words forms a record or block. For instance a record may contain 60 words of 12 characters each. If punched cards are used as input device, record length of 80 characters is convenient.

In a typical use of MT, density of characters is 200 an inch. Twelve characters of a machine word occupy 0.06 inch or 1.5mm. The IRG is about half inch or 12mm. on MT. It is clear, if we have IRG for each word we have an appreciable loss. If, however, we have IRG for 80 words, loss on MT by IRG becomes just 1/10 of useful length.

In a typical case, a reel of MT can contain about

SUMMARY

Character
↓
word
↓
record or block
↓
physical record with IRG
↓
file

3.2 Serial and Inverted Files

Files to be used for ISR will be many fold. How to arrange descriptions for each document on a MT is the problem here.

The very first file will be that which register each document description in an order of arrival or accession to a documentation center. To find out a document of specified content, one must search for the description of this document consecutively throughout the whole file. It takes time. However, if there is no mistake in operation, we have no missing in the result.

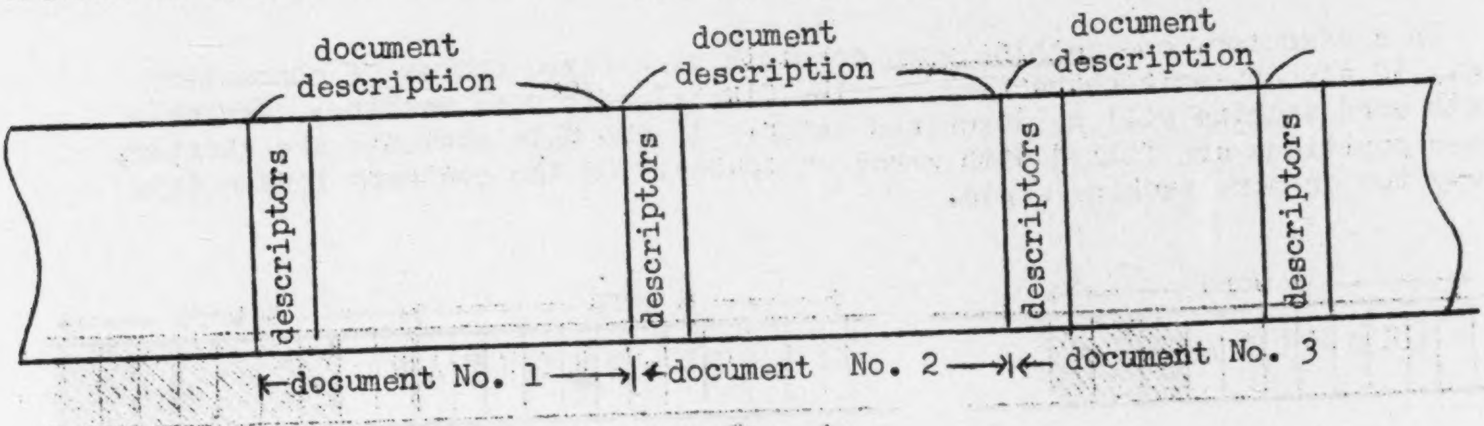
document description
document description
document description
descriptors
descriptors
descriptors
descriptors
document No. 1
document No. 2
document No. 3

Fig. 8

This type of file is called a serial file or sequential file.

The relationship of clues for documents and the description of documents in a serial file is shown in Fig. 9. In this diagram clues are, for instance, taken as descriptors. In the description of document No. 1, descriptors A, D, F, and J are included, in No. 2 descriptors B and D are included, etc.

	1	2	3	4	5	6	7	8	9	10
A	x				x		x	x		
B		x						x		x
C						x				
D	x	x		x		x			x	x
E									x	x
F	x		x			x		x		x
G								x		
H			x				x			
I					x	x				
J	x			x				x		

Fig. 9

Now, a new file can be organized by associating document numbers to each descriptors in alphabetical order (or in any other order you wish) (see fig. 10).

Descriptors	Document Numbers
A	1, 5, 7, 8
B	2, 8, 10
C	6
D	1, 2, 4, 6, 9, 10
E	9, 10
F	1, 3, 6, 8, 10

etc.

Fig. 10

A file arranged by the descriptors mentionning documents numbers are referred to as inverted file. Inverted file is, however, not single in number. If we construct an authors index for these documents, this is also an inverted file. In general, there are as many inverted files as the number of viewpoint or aspect.

Take the case of a telephone directory. Serial file does exist in telephone office. This means the list of subscribers arranged by the order of installation of subscribers set. Telephone directory by name and those by profession (yellow page) are both inverted files. If some telephone company decides to publish a directory by streets and house numbers, this is also an inverted file.

The difference between serial and inverted files is now understood but, if we consider, what kind of file should be a serial file, there is no clear-cut criterion for deciding. The only truth is that one can invert a file into another covering the same objects (documents in the case of Figs. 9 and 10, and subscribers and their characteristics in the telephone directory case). The action of consulting an inverted file is customarily called look-up.

Partially Inverted Files

The preceding discussion revealed that there are many inverted files and we wonder if we had better to prepare all kinds of inverted file in advance. Since the search through a MT takes time, it is not wise to repeat every time when need the search with serial files.

A compromise can be made between a search and a look-up. When we want a retrieval by specific aspects or concepts and if our serial file is not arranged to these specific aspects, we first search the whole MT by any one of aspects. The document descriptions of relevant documents are found, so we transfer these into a free MT and create a new file which is an inverted file by any aspect one wishes to make. This new file is always smaller in size. Next we proceed to look up this new file.

3.4 Requirement for Machines

Retrieval is made either on batch or on-line operation.

A batch operation is made for a batch of requests (for instance 10 to several tens according to the memory capacity of the computer used). This kind of operation is less expensive and is possible with rather small computer.

The usual requirement for machine to perform an ISR operation is

Main memory	16 k words,
MT handler	4 sets,
Card-reader or paper-tape reader	1 set,
Line printer	1 set.

On-line retrieval is, in most cases, based on the time-sharing service (TSS). The time necessary for a request (from the input of a query to the printing out or display on CRT equipment) is very short. The direct use of computer by an inquirer is possible.

However this kind of operation requires a bigger and expensive machine and the programming is more difficult. The cost is therefore high. In usual case, the machine is required to have such capacity and configuration as below:

Machine momory	48 k words,
Magnetic disk-pack	2 sets,
Typewriter (input and output)	1 set.

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TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

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INDEXING AND FILE ORGANIZATION

Yukio NAKAMURA

2.7 Hierarchical Structure among Clues

In previous sections where the combination or coordination of concepts is considered, each controlled word is supposed to be independent. However, we may encounter difficulty when two or more words constitute hierarchical structure.

Hierarchical Concepts

If we want retrieve documents "Elephants in Africa" and if in our file we have "Elephants in Congo," this document should be retrieved. If we use the complete matching method, the concept or word Africa is not equal to concept or word Congo, the retrieval is not possible. It is clear that this result does not satisfy us.

We think the "Elephants in Congo" should be retrieved by the instruction "Elephants in Africa." But how does it achieved? In classification we are familiar with hierarchical relation and know that there is such a relation:

	UDC Numbers
Africa	(6)
Equatorial Africa	(67)
Congo	(675)

Elephants in Congo is denoted by 599.61(675)

The immediate solution is possible if clues are hierarchical classification numbers. Putting our retrieval instruction as 599.61(6$), where $ stands for any number of decimal numbers 1 to 9 or space, this instruction is good for 599.61(67) and 599.61(6).

On the contrary, if words are used some more device is necessary.

The first solution is that, in the thesaurus we shall notify that, between Africa and Congo, a hierarchical relation exists. The measures adopted by the EJC Thesaurus is to show in the following way:

```
AFRICA
  NT  EQUATORIAL AFRICA
      CONGO

CONGO
  BT  AFRICA
      EQUATORIAL AFRICA

EQUATORIAL AFRICA
  BT  AFRICA
  NT  CONGO
      TANZANIA
      (etc.)
```

and in alphabetical list:

```
AFRICA
. EQUATORIAL AFRICA
. . CONGO
. . TANZANIA
```

Here, the signs BT and NT stand for broader term and narrower term, respectively. The user of the thesaurus finds the hierarchical relation by consulting the thesaurus and he must formulate necessary additive measures as

ELEPHANTS * (AFRICA + EQUATORIAL AFRICA + CONGO)

instead of

ELEPHANTS * CONGO.

The second solution is to record these hierarchical relations in the memory (mostly, magnetic disks) of the computer. If the user gives an instruction, the computer checks the words at first, and by use of internal memory broaden the words to be used in the instruction. This can be called internal thesaurus method.

This has been employed in some ISR systems. For instance the ISR System of the MITI is the case.

Related Concepts

In ISR it is also necessary to keep related concepts or words in mind. These terms are similar to "see also" reference in library catalogs.

Example

```
RECORDS
  RT  DOCUMENTS
      DOCUMENTATION
      HISTORY
      PHONOGRAPH RECORDS
```

How to use these related clues? Should all these words be combined by OR relation to the word RECORDS? This is left to the searcher at his discretion when using a thesaurus. In the case of the internal thesaurus the problem is difficult to decide. The choice depends on the case.

In other systems the related concepts are shown graphically. This graph is called "semantic map." The EURATOM Thesaurus gives an example. Figure shows a page from that Thesaurus -- Chart 22 (Geology). Here, words in bald letters are descriptors. The rectangle contains other words also -- words in italic letters are prohibited words. Words in small and normal print are synonyms or words in lower-level of hierarchy. The relation between descriptors and other words corresponds to conventional descriptions in an index:

Detonation USE EXPLOSIONS,

Underwater Explosion USE EXPLOSIONS.

The related words are shown by straight lines with four grades of thickness and the thicker is the line, the closer the relation is. The relations existing with the word EXPLOSIONS is shown in the Alphabetical List as:

EXPLOSIONS

RT SHOCK WAVES
EXPLOSIVES
UNDERGROUND EXPLOSIONS
MINING
SEISMOLOGY

The semantic map is not only more convenient to see, but also it is convenient to choose the adequate descriptors which correctly represent searcher's concept.

2.8 SEMANTIC ANALYSIS

Another approach to the solution of language and meaning problem is made by the Western Reserve University school from the conceptual point of view.

They do not use natural words as clues and they tried to use concepts represented by complicated codes after making analysis of meaning (semantic analysis).

The semantic code system of WRU makes use of 213 concepts as fundamental or generic ones and these concepts have a specific codes, e.g., color is an example and it is shown as C□LR. □ is the space where an infic code should be inserted. Infix codes are shown in Table 1.

The red color is a member of color (in general), so an infix code "A" is inserted to represent a certain color, so as to give CALR. It is not enough, with this code, to denote a specific color, therefore, a numerical code is added to the code CALR; e.g.,

red CALR 016, yellow CALR 019, green CALR 020,
blue CALR 024.

Since colors are interpreted as simple concepts, there is no further analysis and code is necessary.

For a concept compound, analysis is needed. A thermometer is taken as a concept which should be expressed as "heat-measuring apparatus (or machine)." Other words such as pyrometer has also the same meaning "heat-measuring apparatus" (cf. pyro = heat, meter = measuring apparatus). In scientific term, however, pyrometer is more specific measuring apparatus than a simple heat-measuring apparatus in general and, thermometer, too. Then it is possible to denote

thermometer = heat-measuring apparatus type No.2,

pyrometer = heat-measuring apparatus type No.4.

The word "calorimetry" is nothing but the process of heat-measuring. So it is shown as

calorimetry = heat-measuring

In fact these analysis gives semantic codes as below:

thermometer = MACH. MUSR. RWHT. 004X. 002.
pyrometer = MACH. MUSR. RWHT. 004.
calorimetry = MUSR. RWHT. 001.

In these examples, the infix codes are already given and the readers are requested to check the use of them. Note also, in the case of a thermometer, numerical code. 004X. is added after RWHT. which shows that R□HT (heat) is not specific enough to designate temperature which is a member of the concept heat.

Since all measuring devices and apparatus have MACH. MUSR. in common, one can retrieve all the measuring apparatus by giving the instruction MACH. MUSR.

Cf. some other measuring apparatus are:

Tachometer = MACH. MUSR. MWTN. PWPR. 001.
Photometer = MACH. MUSR. RWLT. 002.
voltmeter = MACH. MUSR. LECT. 006X. 001.

TABLE 1

INFIX CODES

Letter	Relationship	USE
A	Categorical	The word coded represents a member of the class represented by the semantic factor. Thus, red is a member of the class color, hence CALT.
E	Intrinsic	The word coded represents something composed of that which is represented by the semantic factor. Thus, diamond is composed of carbon, hence CERB.
I	Inclusive	The word corded represents something which is a component of that which is represented by the semantic factor. Thus wing is a component of bird, hence BIRD.
O	Comprehensive	The word coded represents something made up of several members of the class represented by the semantic factor. Thus mosaic is made up of several crystals, hence CORS.
U	Productive	The word coded represents something which produces, or which is used for or to, that which is represented the semantic factor. Thus, gelation produces colloid, hence CULD; club is used to beat, hence BUTT.
Q	Affective	The word coded represents something which makes use of, is determined by, or is influenced by, that which is represented by the semantic factor. Thus, electroplating makes use of electricity, hence LQCT; phototropism is influenced by light, hence RQLT.
W	Instrumental	The word coded represents something which is produced by, which acts upon, or which is acted upon by, that which is represented by the semantic factor. Thus olive oil is produced by plant, hence BWTN; hardening acts upon metal, hence MWTL; jacketed is acted upon by cover, hence CWCR.
X	Negative	The word coded represents something which has an important characteristic the absence of that which is represented by the semantic factor. Thus, noncorrosive characteristically without corrosion, hence DXTR.

Letter	Relationship	USE
Y	Attributive	The word coded represents something which has as an important characteristic that which is represented by the semantic factor. Thus, modified is characterized by change, hence CYNG.
Z	Simulative	The word coded represents something which has certain properties of, but is not, that which is represented by the semantic factor. Thus, whale is not fish, but resembles it, hence FZSH.

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COMPUTER PRINCIPLES A THREE - HOUR LECTURE FOR LAYMEN

Eimei Shu

1. A brief history

The history of machine aids to computation is almost as long as the history of mathematics itself. For many centuries man has used various devices to help him in carrying out computations. One of the earliest and most ingenious examples of an aid to computation is the abacus. This may be a primitive predecessor of modern computers. Calculating machines, including such familiar devices as adding machines, desk calculators, and cash registers, were invented more recently. Our concern here, however, is solely with the modern high-speed electronic devices that have come into use since about 1940.

Between 1939 and 1944, Aiken built the first general purpose automatic digital computer, called the "Mark I." It is electromechanical, using relays as one of the major calculating devices.

Between 1939 and 1945, Eckert and Manchly built the "Eniac," also a digital computer. It consisted of 18,000 electron tubes, weighed 30 tons, and dissipated 150 kilowatts. The time required for an add operation was only 0.21 sec compared to 300 sec for the Mark I. In 1951 Eckert and Manchly built the first "Univac" for the United States Census Bureau. The "Edvac," completed in 1952, was the first computer to use internally stored instructions (programme).

One of the major characteristics of computers which make them so useful is their speed. A single arithmetic operation can be solved and stored by a computer in a few microseconds whereas a mathematician needs a few seconds to do the same operation and record (or store) it on paper. Thus, the computer can solve the problems and produce an output record of its results, thousands or even millions of times faster than man.

Another characteristic of the computer is accuracy. Once a computer is provided with the correct instructions, the planned operations can be repeated millions of times without a single error. Computers make errors only when there is a breakdown in the computing system, or when there is human error in the prepared instructions.

Once the breakdown or error is detected and corrected, the computer again operates at high speeds and without error.

2. Two classes of computers

Electronic computers are divided into the two broad classes of analog computers and digital computers.

The digital computer may be defined simply as the computer that does arithmetic. It manipulates numbers and the individual digits that constitute these numbers and often executes such basic processes as addition, subtraction, multiplication, and division in very much the same way as a human arithmetician. Examples of digital devices are adding machines, cash registers, and the abacus. Needless to say, the high-speed electronic digital computers that we shall concern ourselves with in this lecture are vastly more sophisticated devices than those states above. However, like the abacus, they are digital in principle and manipulate numbers. Even the directions that the operator gives to the digital computer are numbers, and it is principally in the methods of storing, manipulating, and using these numerical "instructions" that the sophistication of the digital computer is found.

Electronic digital computers are usually more expensive than analog computers but are also usually more versatile. A digital computer can be given a sequence of instructions in which it can execute later steps using the results of the earlier steps. It can also alter the sequence of instructions according to the results of previous steps.

The analog computer accepts continuously varying inputs, and supplies an instantaneous continuously varying output. Analog computers use physical changes as input data and indicate the significance which such changes have on the device or unit as a whole. The input/output data may be either electrical, mechanical, or a combination of both. Conditions such as temperature, pressure, and angular position, must be represented by electromechanical analogies.

In this lecture, we shall concern ourselves solely with electronic digital computers.

3. Time-shared and real-time uses of computers

In many cases large digital systems are used in a manner which relies heavily on the enormous number of records which can be stored in the memory of a digital machine. The purpose of these systems is to provide the user with a large file of information and a computational facility with which he can communicate in a direct manner. The user of the system is able to introduce his introductions to the computer by utilizing some device such as a teletype keyboard or a set of push buttons at a console. The computer responds by either printing the results or displaying them on an oscilloscope. In these systems, the computer is liable to be time-shared. This means that the machine has many input and output information channels and that those channels share the main computational devices. In addition, time-shared systems generally communicate directly with people rather than processing punch-cards or other physical media. The time-shared system responds directly to the user and is shared among a number of users.

The ability of digital computers to make precise calculations and decisions at high speeds has made it possible to use them as parts of control systems. In general, the time elapsing from when data are given to a computer to when results are obtained is called turn-around time. In a control system the turn-around time of a computer is minimized so that the computer, receiving informations from all parts of the system, can process this data immediately and then control the whole system.

A system of sort is called a real-time control system because information must be processed and decisions must be made in real time. When a computer is used to process business data or to perform regular scientific calculations, time is not as critical a factor. In real-time systems, the computer must "keep up," processing all data at high speeds in order to be effective.

Examples of real-time control applications include the use of computers in oil refineries and other manufacturing areas where the computer is used to control the manufacturing processes automatically. Digital computers are also used to guide machine tools which are performing precision-maching operations automatically. Further, both manned and unmanned space vehicles carry digital computers which perform the necessary guidance functions, while a network of computers on the ground monitor and direct the progress of the flight.

4. Number systems

Numbering systems play an important role in our daily life, and in digital computer, too. Usually we count in units of tens, or in the decimal number system. This system, first originated in India, seems to have stemmed from the fact that man has ten fingers. However, the use of ten as the base is the only system for expressing numbers. Any standard radix (base) would serve as well.

Every number system has a radix. When the radix is ten, the decimal system is indicated; when the radix is eight, the octal system is indicated; and when the radix is two, the binary system is indicated. For example, the symbol "312" could represent a number written in the quartic (base four), octal, or digital system, or in any system having a radix of four or greater. Thus,

in the decimal system

$$312 = (3 \times 10^2) + (1 \times 10^1) + (2 \times 10^0)$$
= three hundreds and twelve

in the octal system

$$312 = (3 \times 8^2) + (1 \times 8^1) + (2 \times 8^0)$$
= two hundreds and two

Binary numbers use only ones and zeros. Thus, in the binary system, the symbol "1101" means $(1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$, or thirteen.

The binary system, being simplest possible, is used in the majority of modern computers and in all digital devices. By applying the rules of counting explained above, an example of binary and octal counting evolves as whown in the table below.

Decimal	Binary	Octoal
0	0	0
1	1	1
2	10	2
3	11	3
4	100	4
5	101	5
6	110	6
7	111	7
8	1000	10
9	1001	11
10	1010	12
11	1011	13
12	1100	14

Binary addition is performed in the same manner as decimal addition. The complete table for binary addition is as follows:

0 + 0 = 0
0 + 1 = 1
1 + 1 + 0 plus a carry over of 1

"Carry - overs" are performed in the same manner as in decimal arithmetic. Since 1 is the largest digit in the binary system, any sum greater than 1 requires that a digit be carried over. Here are three examples of binary addition:

Decimal	Binary	Decimal	Binary	Decimal	Binary
5 + 6 11	101 + 110 1011	15 + 20 35	1111 +10100 100011	3.25 + 5.75 9	11.01 +101.11 1001.00

For subtraction, the calculation table becomes as follows:

0 - 0 = 0
1 - 0 = 1
1 - 1 = 0
0 - 1 = 1 with a borrow of 1

A few examples of subtraction are given below:

Decimal	Binary	Decimal	Binary	Decimal	Binary
9 -5 4	1001 -101 100	16 -3 13	10000 - 11 1101	6.25 -4.5 1.75	110.01 -100.0 1.11

The binary multiplication table is:

0 x 0 = 0
1 x 0 = 0
0 x 1 = 0
1 x 1 = 0

Examples:

Decimal	Binary	Decimal	Binary	Decimal	Binary
12 x 10 120	1100 x1010 0000 1100 0000 1100 1111000	102 x 8 816	1100110 x 1000 1100110000	1.25 x2.5 625 250 3.125	1.01 x10.1 1 01 101 0 11.001

The binary division table is:

0 ÷ 1 = 0
1 ÷ 1 = 0

Examples:

Decimal	Binary
5 5)25	101 101) 11001 101 101 101 0

Decimal

```
     2.416 .......
12)29.0000
   24
    50
    48
     20
     12
      80
      72
       8
```

Binary

```
          10.011010101 ......
1100)11101.00
     1100
      10100
       1100
       10000
        1100
         10000
          1100
          .........
```

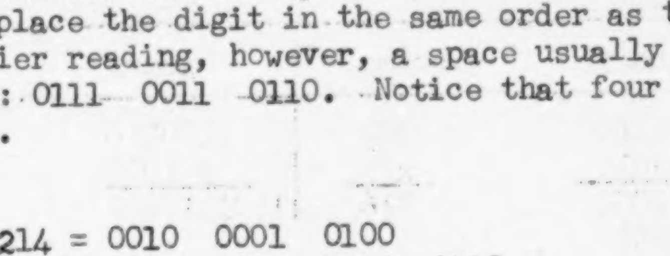
Since the decimal system has been used for a long time, there is a natural reaction to performing calculations in a binary number system. Also, since checks, bills, tax rates, prices, etc., are all figured in the decimal system, the values of most things must be converted from decimal to binary before computations can begin. For these and other reasons most of the early machines were operated in binary-coded-decimal number systems. In such systems a coded group of binary bits is used to represent each of the ten decimal digits. For example, in order to represent 736 (seven hundreds and thirty six), we simply write the coded digit for each decimal, then we place the digit in the same order as the decimals, thus: 011100110110. For easier reading, however, a space usually will be placed between each coded digit, thus: 0111 0011 0110. Notice that four binary bits are required for each decimal digit.

Examples:

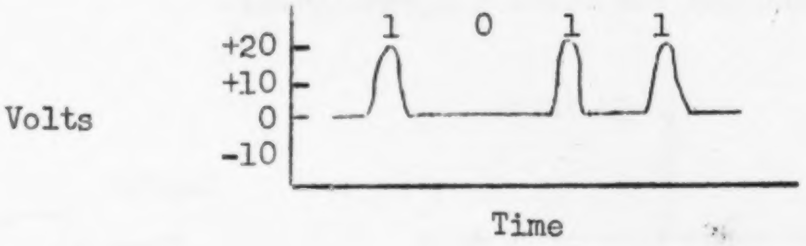
214 = 0010 0001 0100
1246 = 0001 0010 0100 0110

5. How is a binary number represented by electrical signal?

One of the main reasons that the binary system is used in digital computers is that the two binary conditions, 1 and 0, can be easily represented by many electrical/electronic components if the 1 binary state is indicated when the component is conductive and the 0 state is indicated when the component is nonconductive. The reverse of this will work equally as well, i.e., the nonconducting state of a component can be used to represent a 1 binary condition and a conducting state the 0 condition. Numerous devices are used to provide representation of binary conditions. These include switches, transistors, relays, and diodes. These devices are used to generate signals of very short duration called pulses. For example, the figure below illustrates a system where a positive pulse with a peak amplitude of +20 volts is used to represent a 1 and a pulse of -20 volts is used to represent a 0.



Another more common technique is illustrated in the figure below, where 1 is represented by a pulse with an amplitude of +20 volts and a 0 by the absence of a pulse.



The pulses used may be quite short in duration (0.1 sec or less). The shapes of the pulses used are generally standardized throughout a machine. Specifications for a given machine will generally include the maximum and minimum acceptable amplitude, the minimum and maximum pulse width.

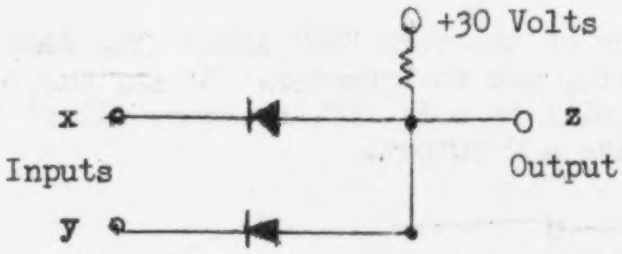
It is seen from the above explanation that it is necessary for the signals to represent only one of two values. The amount of information involved in such signals is usually expressed in bits (an abbreviation of binary digits). Thus one such signal contains 1 bit of information and two of such signals contain 2 bits of information. To put it in rigorous mathematical form, the information capacity in bits of a signal is the logarithm to the base two of the number of possible states of that signal.

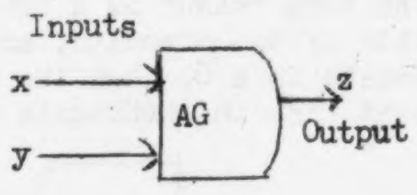
6. Basic logical circuit

In a digital computer, there are several types of circuits which perform logical operations on input signals.

* The AND-gate

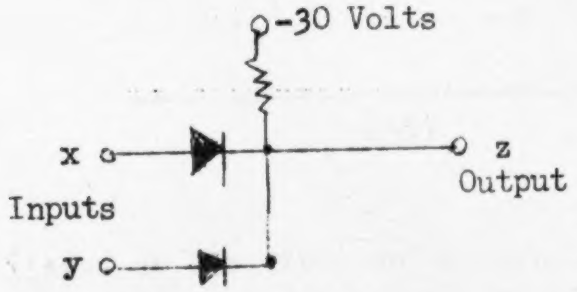
Assume that, in some systems, 0's and 1's are represented by the absence (0) or presence (1) of pulses. The function of the AND-gate circuit is then to produce a pulse at its output only when a pulse is applied to all the inputs to the circuit simultaneously. If the inputs to the circuit are labeled x, y, the circuit will produce an output pulse only when a pulse is simulataneously applied to x AND y. In the figure below are shown an AND-gate consisting of diodes and its block diagrame symbol.

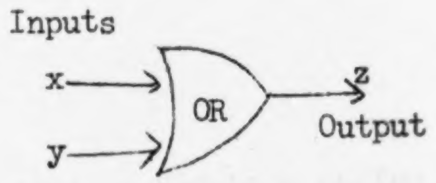




* The OR-gate

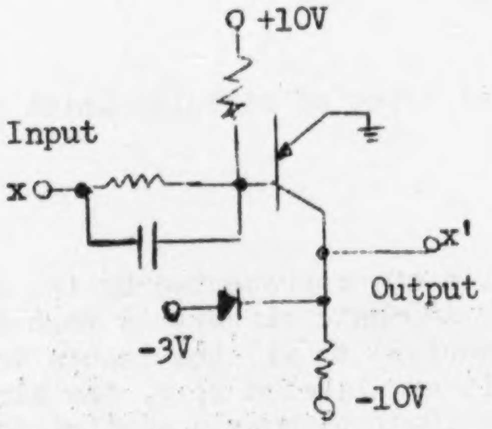
The OR-gate has the property that a signal representing a 1 will appear at the output if any one of the inputs represents a 1. The figure below illustrates a diode OR-gate circuit and its block diagram symbol.

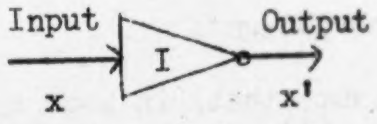

-30 Volts
x
Inputs
y
z
Output


Inputs
x
y
OR
z
Output

* The NOT-gate

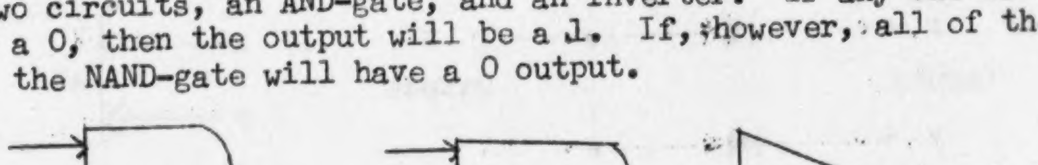
The circuit illustrated below is commonly referred to as an inverter. The output of such a circuit is the inverse or the negation of the input. If the input is a 1, then the output will be a 0, and vice versa. Therefore, we call an inverter a Not-gate. The inverse of a variable, say x, is often designated as x'.


+10V
Input
x
x'
Output
-3V
-10V


Input
Output
I
x
x'

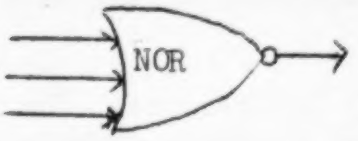
* The NAND-gate

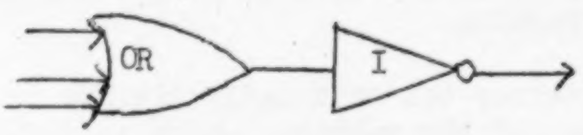
The term "NAND" is a contraction of the term "NOT AND." The NAND-gate is a composite of two circuits, an AND-gate, and an inverter. If any one of the inputs to a NAND-gate is a 0, then the output will be a 1. If, however, all of the inputs represent 1's, the NAND-gate will have a 0 output.



* The NOR-gate

The logical function performed by this gate is that of the OR-gate followed by an inverter or NOT circuit. The output of a NOR-gate is 0 unless all the inputs are 0.





7. Two-valued logics

A method of investigating into the logical relationship among variables that assume only one of two possible values is called two-valued logics. The name "Boolean algebra" is used to identify this system of logic representation in tribute to the English mathematician, George Simon Boole, who introduced the system in 1847,

The fundamental relations of Boolean algebra is listed below.

1. $0 + x = x$
2. $1 + x = 1$
3. $x + x = x$
4. $x + x' = 1$
5. $0.x = 0$
6. $1.x = x$
7. $x.x = x$
8. $x.x' = 0$
9. $(x')' = x$
10. $x + y = y + x$
11. $x.y = y.x$
12. $x + (y + z) = (x + y) + z$
13. $x (yz) = (xy) z$
14. $x (y + z) = xy + xz$
15. $x + xz = x$
16. $x (x + y) = x$
17. $(x + y) (x + z) = x + y z$
18. $x +x'y = x + y$

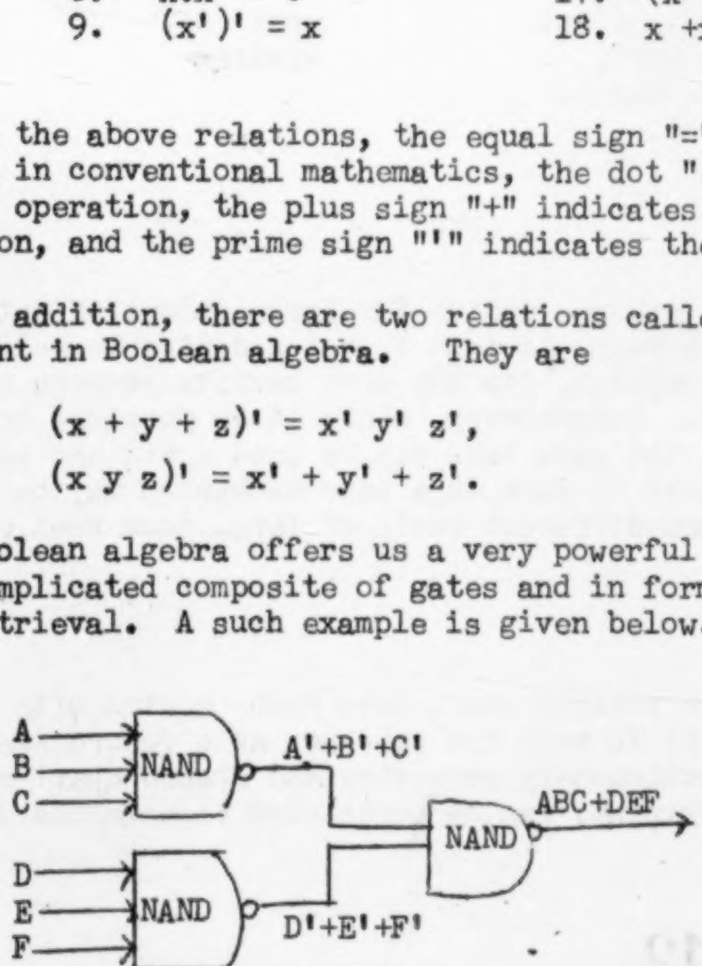
In the above relations, the equal sign "=" represents a relationship of equivalenc just as in conventional mathematics, the dot "." indicates the logical product or the AND operation, the plus sign "+" indicates the logical sum operation or OR operation, and the prime sign "'" indicates the negation operation.

In addition, there are two relations called do Morgan's theorems, that are important in Boolean algebra. They are

$(x + y + z)' = x' y' z'$,

$(x y z)' = x' + y' + z'$.

Boolean algebra offers us a very powerful weapon for analyzing the operations of a complicated composite of gates and in formulating the instructions for information retrieval. A such example is given below.



8. Memories

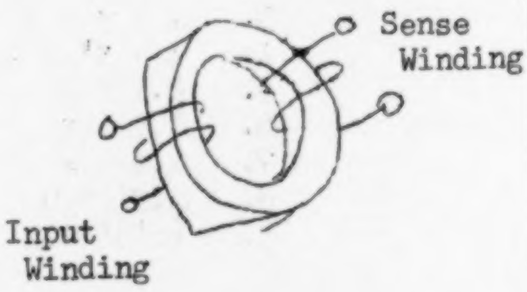
The memory section of the digital computer, also called the storage section is used for (1) storing the data to be processed, and (2) for storing the programme of instructions which are used to direct the processing of the data in a preditermined and organized fashion.

Storage devices can be broadly divided into two classes. The first one is the internal storage of the machine, which is defined as those storage devices which form an integral part of the machine and are directly controlled by the machine. To this class belong magnetic core, tape, and disk memories.

The other class of storage devices are those which are used to introduce information into the computer from the "outside world" and may therefore be called external storage. The storage media in this case generally consist of such input media as punched cards or perforated paper tape, and magnetic-tape.

* Magnetic-core memory

This kind of memory consists of a small toroidal price of magnetic material as shown in the figure.
An input winding is shown on this core; if current is passed through this winding, magnetic flux will be produced, with a direction dependent on the direction of the current through the winding. The retentivity of the material used in the core is such that when the magnetizing force is removed, the core remains magnetized. Since a single core stores only one bit of a word, a large number of cores are required to handle all the bits in every world to be stored. These cores are arranged in arrays.



* Magnetic-tape memory

Magnetic tape is widely used as a storage medium for large amount of data. While, because of its long access time, magnetic tape is not a desirable medium for the main high-speed storage of a computer, its low cost permits storage of vast quantities of information cheaply. Furthermore, since it is possible to erase and rewrite inpormation on tape, the same tape may be used again and again. Another advantage is that, ince the reels of tape on a tape mechanism may be changed, the same mechanism may be used with many different reels of tape, each reel containing different data.

* Magnetic-disk memory

Magnetic disks resemble phonograph records which have been coated with iron-oxide. The disks are arranged in stacks in much the same way as a record stack in a "juke box." All of the disks are continuously revolving and spaced apart so that a record head, driven by an access mechanism, can be positioned between the disks.

9. Input/Output devices

Input and output devices (abbreviated as I/O Devices) provide the computer with the facilities necessary for communicating with the users. Input devices such as card-readers and typewriters supply the computer with data and instructions, while output devices provide the means for changing the data processed by the computer into a form specified by or intelligible to the users. The selection of input/output devices depend on the specific use for which the computer is intended.

Conventional input devices read coded data into computers from punched cards or punched paper tape. Data may be presented at the output in printed form, in plotted form, on punched cards, paper tapes, magnetic tapes, or oscilloscopic displays.

Card punches are actuated by a manual keyboard. The keyboard buttons, when operated, open and close groups of switches which control solenoid-operated punches. Once the holes have been punched in one column, the card punch automatically advances the card so that the next column is located under the punching station punches.

In many applications of computers, printing units are required at the output to translate internal computer data into words and numbers that a human operator can understand. Most of the original printers were converted electric typewriters, the speed of which is relatively low, perhaps from 10 to 30 characters per sec. In modern high-speed computers line-a-time printers are widely used, which, as the name implies, print an entire line at one time. Some printers of this type can print 1250 lines per min. With 160 characters per line.

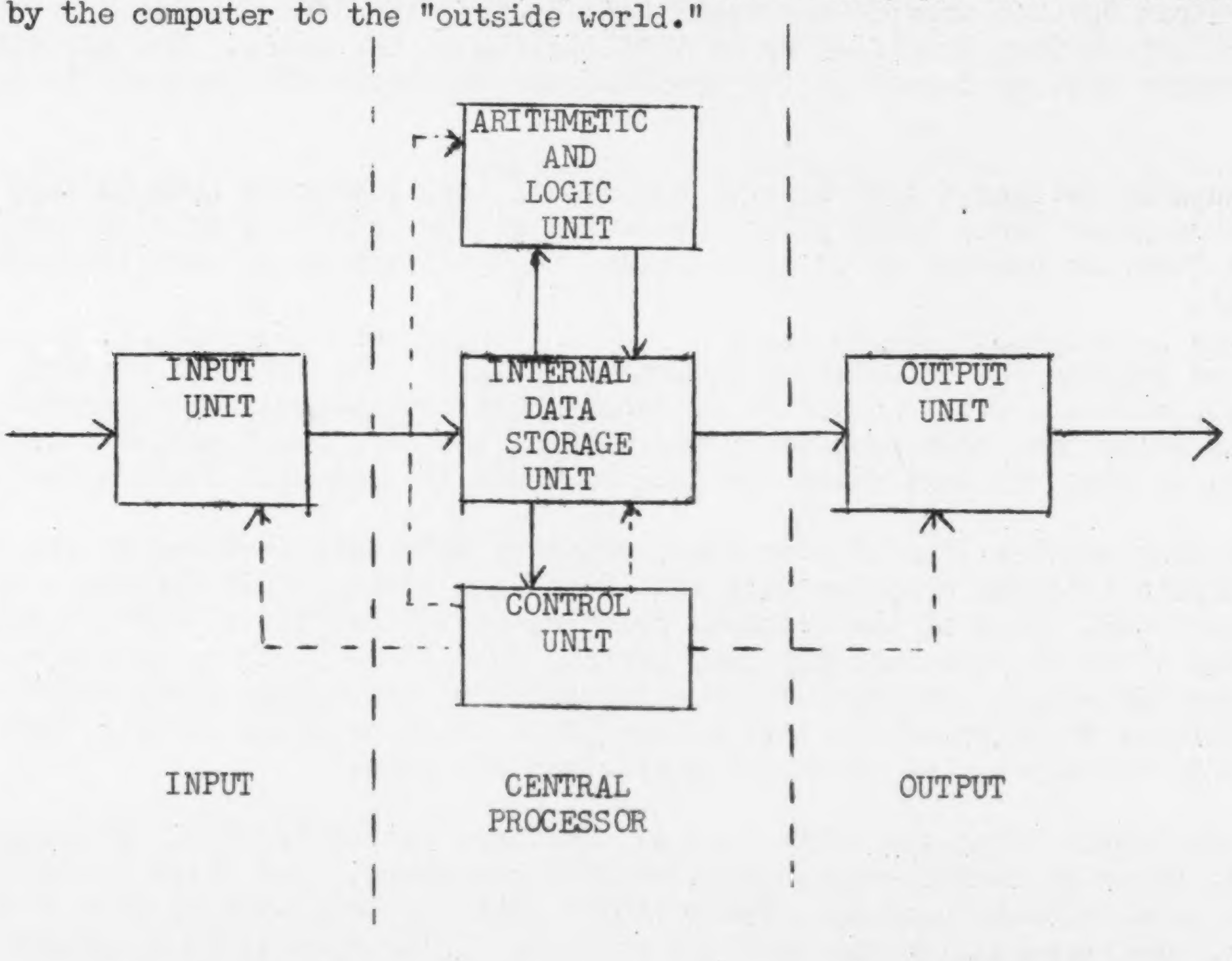
Cathode-ray tubes are often used as auxiliary output devices. There are two distinct types of cathode-ray tubes used with computers. The first is identical to the one used in oscilloscopes. The computer supplies this sort of tube with two numbers, one representing the vertical position of the spot to be displayed and the other the horizontal position. Because of the high speed of this process, a large number of spot is generated per second, and what is essentially a continuous curve is thereby formed.

The second type is the electronic character-writing tube, sometimes called the "charactron." The character-forming part of this tube contains a small matrix through which characters in English letters and Arabic numbers have been cut. The electron beam passes through the selection plates which direct it through the selected character in the matrix. This tube is capable of displaying data at the rate of over 100,000 words per min.

10. Computer system

The basic sections of a digital computer are illustrated in the block diagram shown below. The three center blocks comprise what is generally referred to as the "central data processor." The control section is comparable to a telephone exchange. It directs the operations of the computer under the direct influence of a sequence of instructions. The instructions are comparable to the phone numbers dialed into a telephone exchange and cause certain switches and control lines to be energized.

The arithmetic section performs arithmetic and logic operations on the input or stored data. The control unit instructs the arithmetic unit to perform the specified arithmetic operation (addition, subtraction, multiplication, or division), and controls the storage of the results in some specified location in memory. The output section, which is also directed by the control unit, presents the results obtained by the computer to the "outside world."



11. Hardware and software

As contrasted with the physical aspects (devices, mechanism, electrical circuitry, etc.) of a computer that are collectively called "hardware," there is another important field of techniques in a modern digital computer called "software." The term "software" is defined as the totality of programmes and routines used to extend the capabilities of computers, such as compilers, assemblers, narrators, routines, and subroutines.

A digital computer does not figure out its own solution to problems but must be told exactly how to solve any given problem. It can not be used to solve a problem until each step of the procedure to be followed has been work out. It is the task of a programmer or a software engineer to work out this procedure.

Details of software will be given in the nex three-hour lecture on "Computer Programming."

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Tokyo, 20 July - 21 August 1970

CORRIGENDUM

page 2 para. 3 line 7	states	stated
page 2 para. 7 line 5	introductions	instructions
page 3 para. 2 line 2	A system of sort	A system of this sort
page 3 para. 3 line 4	precision-maching	precision-machining
page 3 para. 4 line 4	the base is the...	the base is not the ...
page 4 para. 1 line 3	as whon	as shown
page 5 table (above)	Binary 110.01 -100.0 1.11	Binary 110.01 -100.1 1.11
page 5 para. 2 line 5	1 x 1 = 0	1 x 1 = 1
page 5 para. 4 line 3	1 + 1 = 0	1 + 1 = 1
page 6 para. 1 line 2	in a binary	in the binary
page 7 para. 2 line 1	(0.1 sec or less)	(0.1 μ sec or less)
page 7 para. 5 line 5	simulataneously	simultaneously
page 9 para. 4 line 1	called de Morgan's	called De Morgan's
page 10 para. 1 line 3	preditermined	predetermined
page 10 para. 4 line 1	toroidal price	toroidal piece
page 10 para. 4 line 12	every world	every word
page 10 para. 5 line 5	inpormation	information
page 10 para. 5 line 6	that, ince	that, since
page 12 para. 4 line 1	nex	next

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DOCTEC/LEC/17
Tokyo, 6 August 1970
Original: English

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PRACTICE IN COPYING AND MICROIMAGE TECHNIQUE

Masao Nakabayashi

1. COPYING METHODS

Recently, a new class word -Reprography- come to appear as a concept united copying with printing. Furthermore a concept of graphic arts which are named generically printing technique come to be generalized too.

An outline of copying methods which are based on the reference is given in this paper

As microimage technique which is attentioned to contains much plentifully in the reference, the technique will be explained in the following.

2. REPRODUCTION PROCESS AND ITS CHARACTERISTICS

Copying methods - explained in a broader sense - are mentioned below. The underlined words are the process in relation to the microimage technique.

Silver Halide, Stabilization, Autopositive, Verifax, Ektalith, DTR (Diffusion Transfer Reversal), Diaversal, Dalaroid, Dry Silver, Thermo-Fax, Eichner, Ektafax, Xerography, Electrofax, Diazo, Kalvar, Dual Spectrum, Electrolytic, Imagic, PCMI (Photo-Chromic Micro-Images), Copy-Chrome.

3. MICRO FILMING

Microfilming is a general term for the process and system which takes graphic data - drawings, literatures etc. in the 16mm or 35mm films. There are many definitions for microfilming. In former days, microphotography was a general term, but recently the words microfilm, microfilm copy and microfilm record are used. As a system, the term "Micrographics" - graphic and microfilm conbined - expresses the microfilming system directly.

4. THE ADVANTAGES OF "MICROGRAPHICS"

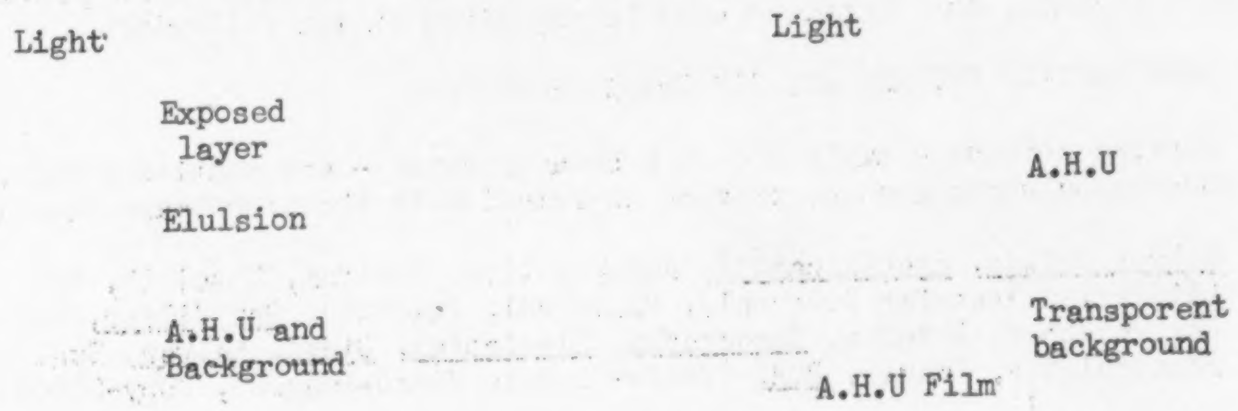
Main features of microfilming process can be, microfilmization of documents is put in order as five R's. That is, (1) Record, (2) Remember, (3) Retention, (4) Retrieval and (5) Reproduction.

These 5 R's are called "film work" against paper work. Though the advantage differs with system, but in general, following eight advantages can be mentioned:

(1) Saving of space
(2) Security of documents
(3) Cut down of time-cost
(4) Preservation with durability
(5) Correctness of photographic document
(6) Completion of communication
(7) Rapid search of information
(8) Rapid restoration of information

5. CHARACTERISTICS OF MICROFILMS

(1) Structure of film



(2) Features of film

Incombustibility, Broad ability to reproduce different colors, High contrast, super-fine grain, High resolving power (630mm. per line in maximum), High preservability.

(3) Kinds of second generation films

Positive film, Direct duplicating film, Diazo film, Kalvar film.

6. MICROFORMS

(1) Rolls

The width of the roll films are usually 16mm, 35mm, 70mm, and 105mm and up to approximately 100 ft in length and no perforations along the edges.

There is a method to handle the films by packing 16mm microfilm in 100 ft - roll cartridge. This roll is transformed further and used in various forms which follow.

(2) Strips

Strips can be produced from roll forms simply by cutting rolls into strips of about from 25cm to 30cm length, and are affixed to the holder of strips by means of an adhesive.

(3) Microfiches

Microfiches are sheets of film of various size containing series of images of a document arranged in rows.

There are specifications by NMA, COSATI and RECORDAK.

(4) Jackets

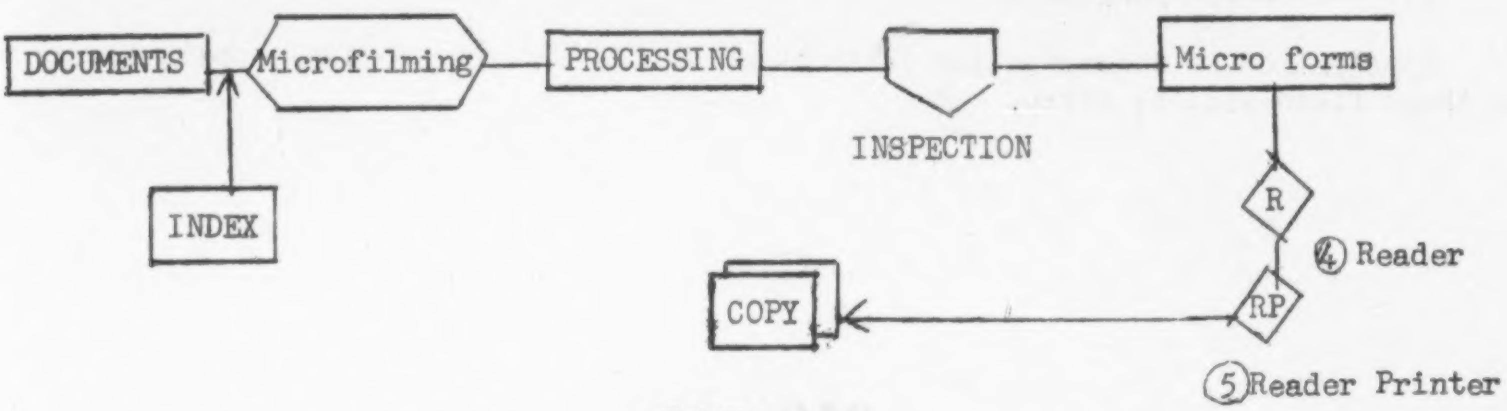
Myler base sheet containing pockets in which strips of either 16mm or 35mm film can be inserted and indexed after the subject of information contained. Copy of the jacket become microfiche.

(5) Aperture cards

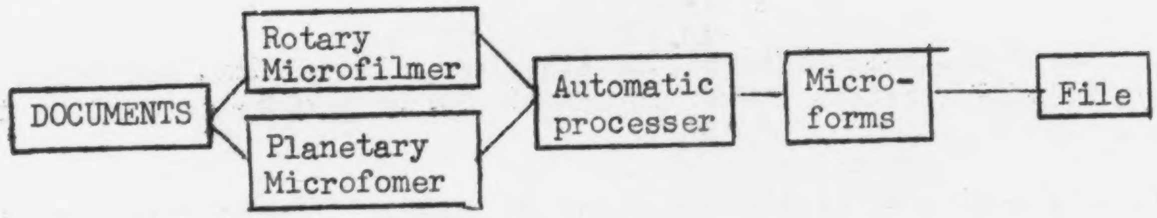
A frame of 35mm film or several frames of 16mm film is inserted into or collated onto a standard tabulating card with rectangular aperture. Indexing can be made in the same way as conventional cards.

These microforms are selected according to the system. The important thing is the retrieval of documents.

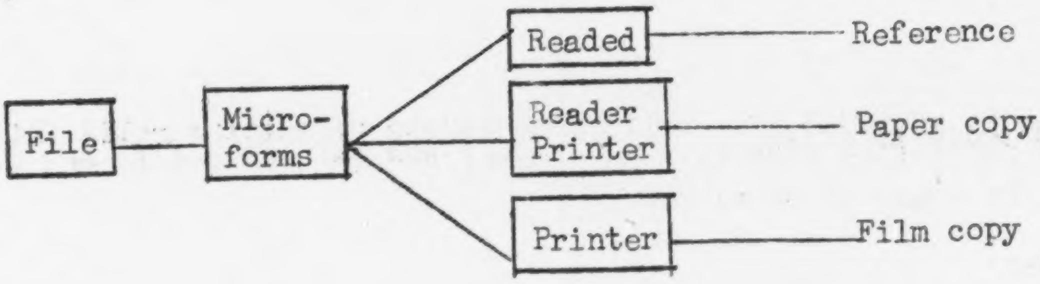
7. EQUIPMENT SYSTEM



(1) Input


DOCUMENTS
Rotary Microfilmer
Planetary Microfomer
Automatic processer
Micro-forms
File

(2) Octput


File
Micro-forms
Readed
Reference
Reader Printer
Paper copy
Printer
Film copy

8. SYSTEM CONCEPT

Fundamental concepts are well formulated as for the software in EDP and UDC in documentation, but software of microfilming has still much room to develop. Since record management differs according to the companies concerned, the speed of retrieving documents become a problem.

"File Control" as a method of "Instant Information" - which permits microfilming and facilitates retrieval - will be presented by using charts.

9. APPLICATION EXAMPLES

Microimage techniques are used extensively in companies and organizations. Fields of employment can be grouped into three parts:

(1) Financial market

(2) Document management

(3) Blueprint management

Application in documentation is included in (2) and some typical applications in these field will be given.

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Tokyo, 20 July - 21 August 1970

D5. COMPUTER PROGRAMMING

Ikuo Anzai

I. Programmes and Programming

A. Software

Assemblers, compilers, generators, subroutine libraries, operating systems, application programmes.

B. Programme

A set of plans for solving a problem. A sequence of instructions for the computer to do its work.

C. Stored-programme

The programme is read into and stored in the Central processing unit in advance to the actual calculation.

D. Programming

The process of analyzing a particular job and specifying a sequence of instructions for the computer to do the job.

Allocation of Programmer's Time

(1)	Job analysis	25%
(2)	Flowcharting	10%
(3)	Coding	20%
(4)	Programme test	20%
(5)	Documentation	10%
(6)	Maintenance	15%

II. Programming Languages

A. Machine language

A language for writing instructions in a form to be directly interpreted by the computer.

B. Symbolic assembly language

Mnemonic symbols are used for instruction codes and addresses.

C. Compiler language (Automatic programming language, problem-oriented language, procedural language)

1. FORTRAN (Formula Translator)
   Developed by I.B.M. for it's 704.

   FORTRAN I (1957)
   FORTRAN II (1958)
   FORTRAN IV (1962)

2. ALGOL (Algorithmic Language)
   Developed by scholars in Europe.

   ALGOL 60 (1960)
   Revised ALGOL 60 (1962)

3. COBOL (Common Business Oriented Language)
   Developed jointly by U.S. Department of Defense, manufacturers and users.
   CODASYL (Conference on Data Systems Language)

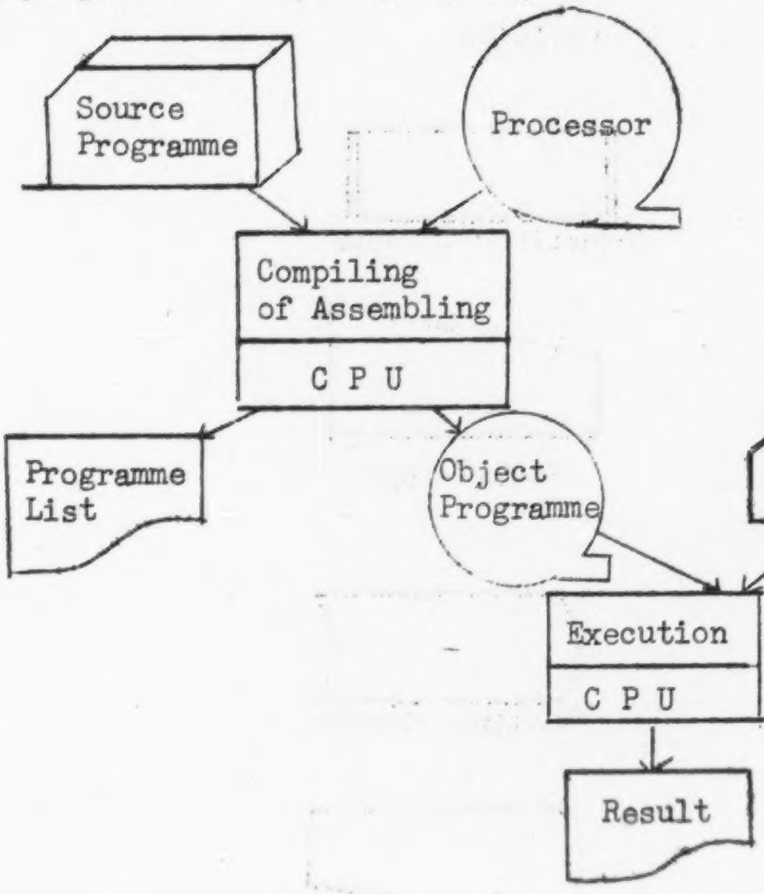
   COBOL - 60 (1960)
   COBOL - 61 (1961)
   COBOL - 61 Extended (1963)
   COBOL Edition 1965 (1965)

4. PL/1 (Programming Language/1)
   Developed by I.B.M. for it's 360.

D. Language Processors

Processor {Assembler
Compiler

Source programme to object programme


Source Programme
Processor
Compiling of Assembling
C P U
Programme List
Object Programme
Data
Execution
C P U
Result

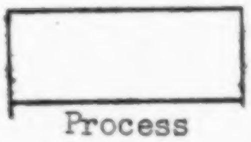
III. Flowchart

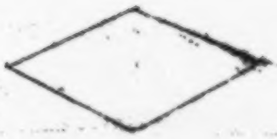
A. System flowchart
The flow of data, input/output media, where the data is processed.

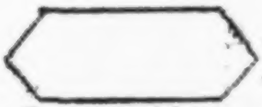
B. Programme flowchart
Graphic presentation of the procedure of processing data.

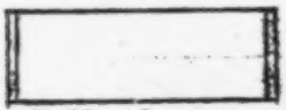
1. General flowchart
2. Semidetailed flowchart
3. Detailed flowchart

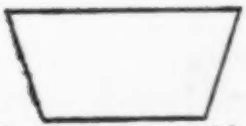
C. Flowchart symbols

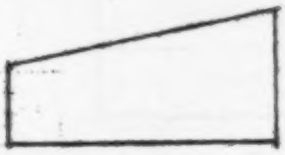

Process

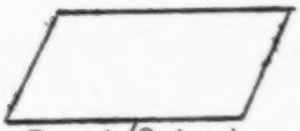

Decision

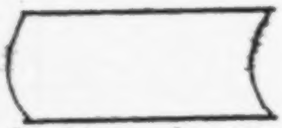

Preparation

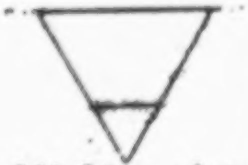

Predefined process

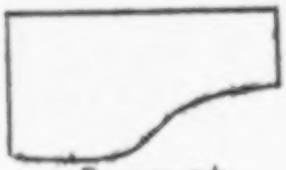

Manual operation

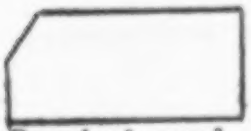

Manual input

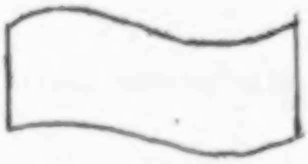

Input/Output

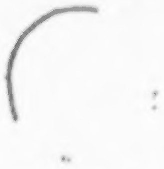

On-line storage

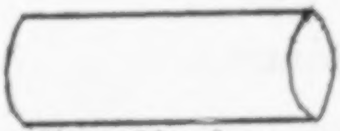

Off-line storage

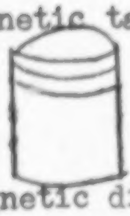

Document


Punched card

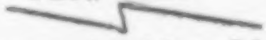

Punched tape


Magnetic tape

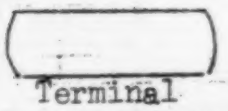

Magnetic drum


Magnetic disk

Flow line


Communication link

Connector

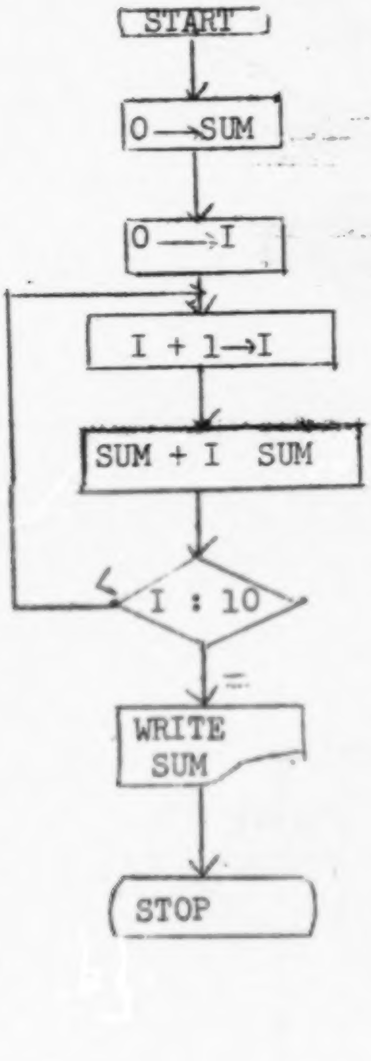


Terminal

D. Sample Flowcharts

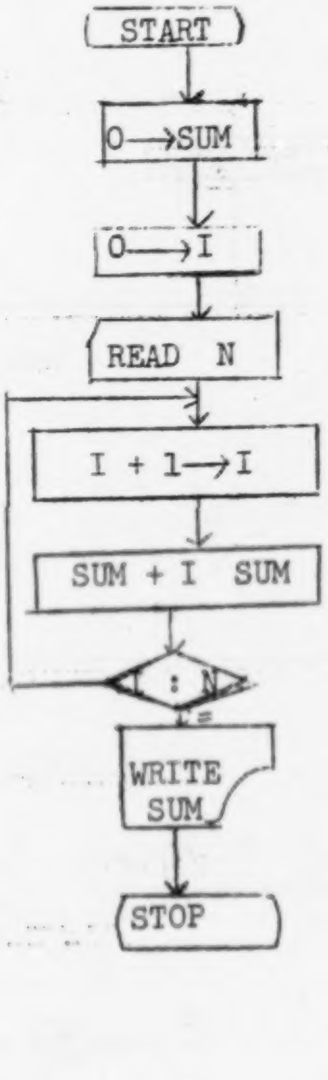
Sample 1

1 + 2 + 3 + ... + 9 + 10


START
0→SUM
0→I
I + 1→I
SUM + I SUM
<
I : 10
=
WRITE SUM
STOP

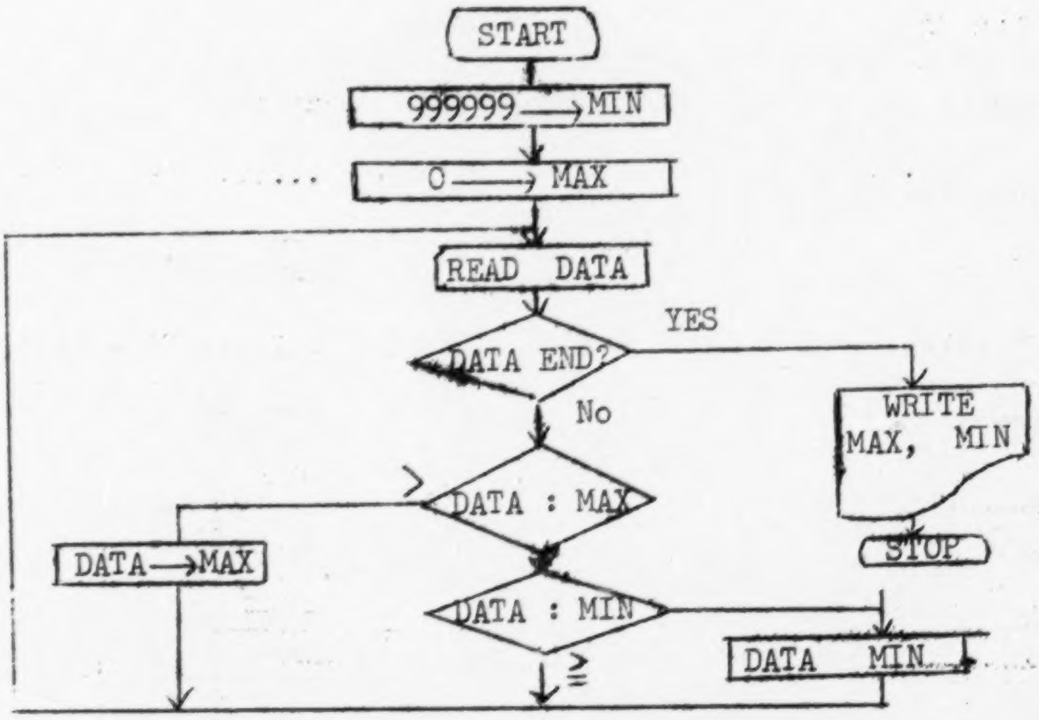
Sample 2

1 + 2 + 3 + ... (n - 1) + n

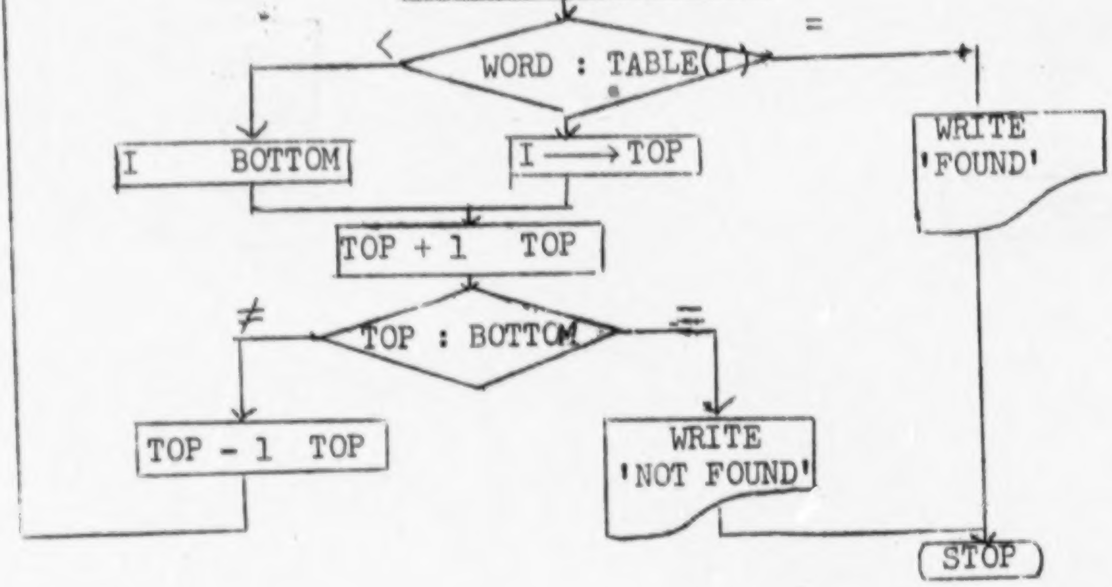

START
0→SUM
0→I
READ N
I + 1→I
SUM + I SUM
<
I : N
=
WRITE SUM
STOP

Sample 3

Finding the maximum and minimum


START
999999 → MIN
0 → MAX
READ DATA
DATA END?
YES
No
WRITE MAX, MIN
STOP
>
DATA : MAX
DATA → MAX
DATA : MIN
DATA MIN
≧

Sample 4. Binary search


START
LIMIT + 1 → BOTTOM
0 → TOP
(TOP + BOTTOM)/2 I
<
WORD : TABLE(I)
=
I BOTTOM
I → TOP
WRITE 'FOUND'
TOP + 1 TOP
≠
TOP : BOTTOM
=
TOP - 1 TOP
WRITE 'NOT FOUND'
STOP

IV. FORTRAN

A. Character set

0, 1, 2, 3, 4, 5, 6, 7, 8, 9
A, B, C, ..., Z
Space = + - * / ( ) , .

B. Coding form

Col. 1 - 5 .... Statement number
Col. 6 .... Continuation sign
Col. 7 - 72 .... Statement
Col. 73 - 80 .... Identification

C. Basic statements

1. Arithmetic Statement

   v = e

2. Unconditional GO TO Statement

   GO TO n

3. Computed GO TO Statement

   GO TO (n_1, n_2, ...n_m), i

4. Arithmetic IF Statement

   IF (a) n_1, n_2, n_3

5. DO Statement

   DO n i = m_1, m_2, m_3

6. READ Statement

   READ (i, f) list

7. WRITE Statement

   WRITE (i, f) list

8. FORMAT Statement

   FORMAT (S_1, S_2, ... S_n)

9. STOP Statement

STOP or STOP m

10. END Statement

END

V. COBOL

A. Character set

0, 1, 2, 3, 4, 5, 6, 7, 8, 9
A, B, C, ...Z
Space + - * / = $, ; . " ( )

B. Coding form

Col. 1 - 6	Sequence number area
Col. 7	Continuation - comment area
Col. 8 - 11	A area
Col. 12 - 72	B area
Col. 73 - 80	Programme name area

C. Programme structure

```
IDENTIFICATION DIVISION.
ENVIRONMENT DIVISION.
   CONFIGURATION SECTION.
   INPUT-OUTPUT SECTION.

DATA DIVISION
   FILE SECTION
   WORKING-STORAGE SECTION.

PROCEDURE DIVISION.
```

D. Basic statements

OPEN, CLOSE
READ, WRITE
ACCEPT, DISPLAY
COMPUTE
ADD, SUBTRACT
MULTIPLY, DIVIDE
MOVE
SET
GO TO
STOP
IF
PERFORM
ENTER
CALL
EXAMINE

COBOL SAMPLE PROGRAMME

```
001010 INDENTIFICATION DIVISION.
001020 PROGRAMME-ID.   COBOL SAMPLE PROGRAMME.
001030 AUTHOR.         IKUO ANZAI.
001040 DATE-WRITTEN.   08-11-1970.
001050*    CARD-TO-TAPE CONVERSION.
001060 ENVIRONMENT DIVISION.
001070 CONFIGURATION SECTION.
001080 SOURCE-COMPUTER.  EXPO - 70.
001090 OBJECT - COMPUTER.  EXPO - 70.
001100 INPUT - OUTPUT SECTION.
001110 FILE - CONTROL.
001120     SELECT CARD - FILE ASSIGN TO CR.
001130     SELECT TAPE - FILE ASSIGN TO MT1.
001140 DATA DIVISION.
001150 FILE SECTION.
001160 FD CARD - FILE.
001170     LABEL RECORD IS OMITTED.
001180     DATA RECORD IS CARD - RECORD.
001190 01  CARD - RECORD  PICTURE x (80).
001200 FD  TAPE - FILE.
001210     LABEL RECORD IS STANDARD.
001220     DATA RECORD IS TAPE - RECORD.
001230 01  TAPE - RECORD PICTURE x (80).
001240 PROCEDURE DIVISION.
001250 OPEN - FILE.
002010     OPEN INPUT CARD - FILE.
002020     OPEN OUTPUT TAPE - FILE.
002030 READ - DATA.
002040     READ CARD - FILE AT END GO TO FINISH.
002050     MOVE CARD - RECORD TO TAPE - RECORD.
002060     WRITE TAPE - RECORD.
002070     GO TO READ - DATA.
002080 FINISH.
002090     CLOSE CARD - FILE.
002100     CLOSE TAPE - FILE.
002110     STOP RUN.
```

Distribution: limited

DOCTEC/LEC/19
Tokyo, 12 August 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

EDITING AND PRINTING IN DOCUMENTATION

Dorothy U. Mizoguchi
Cancer Institute, Tokyo

Editing is a process of preparing a manuscript for printing. This should be a purely mechanical process of marking a copy, which is called "copy editing," but in actuality, the manuscripts written for various journals require more than just mechanical marking. As we all know, majority of scientists who write a paper for publication in scientific journals rarely adhere to various rules set down by such journals, and there are many journals which do not have any rules for writing a paper to be printed in them. In this age of "information explosion," no one can cope with publications that are printed in "any old way." Scientific journals are important source of primary information to be used by a large number of people all over the world and there must be certain rules to be adhered for easy handling and utilization of informations contained in them. In other words, there must be "standardization"; standardization of terms and units used, way of presenting data, layout of printed pages, and the style of printing.

Looking from the side of "users" of scientific journals, it is essential that certain items are always found in the same place in each issue of the journal. In addition, if and when the journal is printed in a less well-known language, the journal should have the necessary informations in the languages that are understood by the majority of people, such as English, French, or German; for example, the name of the journal, volume and number, name and address of the publisher, etc., in addition to contents of the articles, title and author of each paper, and synopsis or abstract of each article. This will facilitate librarians and documentalists handling such journals.

This standardization of the layout of journals is given in the ISO Recommendation R8 'Layout of Periodicals.' Since it will be difficult to change the style or layout of journals once they are printed and published, this ISO Recommendation should be studied carefully before any journal publication is put into practice.

In order to make the process of editorial work easier, it is necessary to set the rules for writing a paper in a particular journal. These rules are variously termed as 'Notice to Authors,' 'Guide for Authors,' 'Instruction for Authors,' etc. These rules should be laid out carefully, giving definite rules for the kind of papers accepted, contents and order of presentation, and how to give tables and figures. In addition, there must be explicit explanation on the terminology and units to be used, abbreviations that can and cannot be used, and how to give literature references. There is still no set rule for abbreviation journal titles used by all the scientific world, although a U.S. Standard has recently been published and this is said to incorporate British Standards and ISO Recommendations. Even if such rules are available, scientists will write in their own style but their manuscripts can be returned for rewriting if definite rules are available.

In addition to rules for writing a paper, it would be more convenient, both for the writer and editor, to be given instructions on preparing a manuscript copy; how to type and what kind of typewriter to use, how to type tables and chemical formulae, how to make corrections in the manuscript, etc. There are various kinds of typewriters and type papers, and it would not help the technical editors if everybody used any size and any kind of paper, and any style of type face. Size of typewriting papers to be used, margin on each page, pagination, and spacing must be all clearly defined.

A technical editor of a scientific journal has the responsibility of producing journals in uniform style, whether in presentation of each paper, size of type faces used, or in the whole style of printing. In order for the editor to carry out this responsibility, there must be set rules for writing a paper and for preparing a manuscript.

The papers accepted for publication are marked by the technical editor for the printer. The manuscripts are marked for special size types, headings and sub-headings, bold-face and italics, and for superscripts and subscripts when used. In scientific papers, there may be Greek alphabets, symbols, and various numerals besides ordinary Roman letters of the alphabet. These must all be marked for the printer.

When the manuscript has been set in type, a galley proof is usually sent to the author for final approval. Scientists (at least the Japanese ones) are not well acquainted with proof reading and will mess up the galley proof more than is necessary. For this reason, the recommended style of correcting a galley proof should also be included in the rules for writing a paper. The galley proof corrected by the author should be gone over carefully by the technical editor because the technical editor is more likely to find printing errors. However, the author should be responsible for all the figures and data in his paper, not the editor.

Printing technique has made a tremendous advance in the past few years. Besides the ordinary typesetting composition, there are photocomposition and even electronic typesetting by a computer. The use of these techniques is not within everyone's reach but the possibility of their use must be understood.

Besides the usual typesetting by hand, which is now rarely used by a large up-to-date printer, monotypes and linotypes do the work at present. These are the same as ordinary typewriters and can set type much faster than by hand, but there is a problem of making changes more difficult. For this reason, the manuscripts should be prepared more carefully and according to set rules.

For faster printing, such as programmes and abstracts for large scientific meetings and conventions, type offset printing is being increasingly used. This is printing straight from the manuscript typed by the author. Besides not requiring technical editing, there is no necessity for proof reading and any mistakes the author makes in his manuscript will appear in the publication. This requires a careful preparation and typing of the manuscript by the author. This method is adopted by the so-called 'letter journals' which publish short communications typed by the author himself for rapid publication. Besides being rapid, this method of printing offers various advantages such as easy reproduction of graphs and tables, chemical and mathematical formulae, and even photographs, without requiring special treatment like drafting and tracing. The size of printed pages can be varied optionally, irrespective of the size of the original manuscript. Another advantage is being able to know the exact number of pages for each paper or each issue, which is a difficult business in typeset printing.

References

ISO/R4 - International Code for the Abbreviation of Titles of Periodicals (1954)

ISO/R8 - Layout of Periodicals (1955)

ISO/R18 - Short Contents of Periodicals or Other Documents (1956)

ISO/R30 - Bibliographical Strip (1956)

ISO/R77 - Bibliographical References. Essential Elements (1958)

ISO/R215 - Presentation of Contributions to Periodicals (1961)

ISO/R690 - Bibliographic References. Essential and Supplementary Elements (1968)

ISO/R832 - Abbreviations of Typical Words in Bibliographical References (1968)

ISO/R833 - Abbreviations of Generic Names in Titles of Periodicals (1968)

'American National Standard for the Abbreviation of Titles of Periodicals' (Z39.5-1969). American National Standards Institute. 1430 Broadway, New York, N.Y. 10018, U.S.A. $2.75 a copy.

ISO Recommendation R8 September 1954

LAYOUT OF PERIODICALS

Introduction

The purpose of these rules is to enable editors and publishers so to shape the form of their periodicals as to facilitate their use by readers and librarians; by following the rules, editors and publishers will find that they have also made their own task easier, since the rules make for order and clarity. These rules are not all of equal importance, and some of them may be contrary to certain conceptions concerning artistic presentation, the technique of production, or advertisement. In such cases, they should be followed as closely as possible.

1. TITLE

1.1 The title of a periodical should be as short and as easily quoted as possible. It may be amplified by a sub-title. If it is composed of initials, these should be explained by the sub-title.

1.2 The title or the sub-title should define as exactly as possible the specific field of knowledge with which the periodical is concerned.

1.3 The title should be uniform wherever it appears. It should be the same in text and speling on the first page of the cover, on the title page, in the table of contents and in the index. Elsewhere, e.g. in the running head, it may be abbreviated in accordance with the International Code for the Abbreviation of Titles of Periodicals (ISO Recommendation R 4).

2. ISSUE

2.1 The format of all issues of a periodical should be the same[1] A sufficient margin should be left for cutting and binding.

2.2 The covers should not be paginated with the text.

2.3 Advertisements should never obscure the title or other bibliographical details printed on the covers.

2.4 The front page of the cover, or the first page of the body, should serve as temporary title page of the issue, that is, it should give:

the title,
the name of the sponsoring organization (if any),
the number of the volume and issue (see paragraph 3.5.1),
the name of the editor(s) (if any),
the name and address of the publisher,
the date of issue,

---

[1] Except as provided in paragraph 4.1

a bibliographical strip, to be printed on the lower margin of the front page of the cover. Reference should be made for details to the Draft ISO Recommendation No. 31 -- Bibliographical strip.

It is desirable that these items should appear always in the same place in each issue of a periodical.

2.4.1 When an issue contains an index to the volume, this fact should be noted on the temporary title page (see paragraph 2.4)

2.5 The frequency of publication, the price of the subscription and the price of a single issue should appear in the same position in each issue.

2.5.1 The contents list should also appear in the same position in each issue.

2.6 Where it is possible to print the title of a periodical on the spine of a single issue, this should be printed either across the spine or along the spine in such a way as to be readable when the issue is lying flat, front cover uppermost. In addition to the title, the dates, the number and the pages of the issue should be given.

2.7 It is recommended that the issue number should be printed on the front cover as near the spine as possible, preferably to the left of the bibliographical strip.

2.8 Unless absolutely necessary, the printing of the text in more than one colour is to be avoided.

3. VOLUME

3.1 A volume should include:

the tiele page,
the table of contents page(s),
the text,
the index(es)

3.2 It is desirable that, when possible, the year of publication should correspond to the calendar year.

3.3 Should, however, the period covered by the volume not correspond to the calendar year, the period covered should be indicated on the title page (e.g. Vol. 37, October 1948 - June 1949).

3.4 The year(s) to which the volume relates should be given in Arabic numerals.

3.5 The numbering of volumes should be in a single sequence in Arabic numerals (e.g. Volume 54). The simultaneous use of numbering by volume and numbering by year should be avoided.

3.5.1 The first issue of a volume should always carry the serial number 1.

3.6 It is undesirable for a volume to contain more matter than can be bound in one part. Should binding in more than one part be unavoidable, the numbering of the parts should be in a single sequence in Arabic numerals.

3.7 The title page of the volume should contain the following:

the title of the periodical,
the name of the sponsoring organization, if any, and/or the name(s) of the editor(s)
the number of the volume,
the year(s) to which the volume relates,
the number of the part and the period covered if the volume is bound in more than one part,
the place of publication,
the name and address of the publisher.

3.8 Each page of a periodical should carry the indications necessary for the rapid identification of the periodical (particularly as photographic reproductions of single pages of periodicals, are often made and distributed). These indications may appear anywhere, but in principle should always be in the same place. They should include:

the title of the periodical (abbreviated if necessary),
the number and/or the year of the volume (or the number and/or the date of the issue),
the number of the page.

For bibliographical periodicals, it is recommended that each page should carry in its upper margin an indication of the subject category dealt with on that page.

3.9 The pagination of the whole of the text of a volume should be in one single sequence in Arabic numerals beginning with 1.

3.9.1 A special pagination is necessary for plates not in the normal pagination. A special pagination is also necessary for extra items, such as maps or engravings, not intended to be bound with the volume. It is desiravle that such plates and extra items be provided with the indications of identity prescribed in paragraph 3.8. They should preferably be mentioned in the table of contents.

3.9.2 It is desirable that the advertisement pages be so printed that they can be omitted from the bound volume if so desired. In that case, such pages should bear a special pagination.

3.9.3 The parts of the volume (e.g. title page, table of contents and index) intended to be bound at the beginning of the volume should not be included in the general pagination. The parts of the volume (e.g. table of contents and index) intended to be bound at the end of the volume should be included in the general pagination.

4. SPECIAL CASES

Introduction. The rules formulated above are meant to be applied to every sort of periodical whenever possible. If it is found unavoidable to set aside one or more of Unesco rules, the following set of rules should enable this to be done with the least amount of trouble or annoyance to the readers and users of the periodical.

4.1 It is undesirable to alter the size of a periodical, but if this becomes unavoidable, the change should be made only at the beginning of a volume.

4.2 If two or more periodicals are amalgamated, and none of the titles is retained, a new periodical should be formed beginning with volume 1. If one of the titles is retained, the numbering belonging to this title should be continued. In no circumstances should a double numbering of the volume be made.

4.3 If a periodical splits up into two or more periodicals, and the old title is not retained, all the new periodicals should begin with volume 1. If the old title is retained by one of them, the numbering of its volums should be continued.

4.4 The title of a periodical should not be altered. If, however, for unavoidable reasons, it has to be altered, this should be done at the beginning of a volume, which should start a new series beginning with the number 1.

4.5 If on account of the changes named in paragraphs 4.1 to 4.4 a new volume has to begin during a calendar year, it should end at the end either of that year or of the next.

4.6 All the changes named in paragraphs 4.1 to 4.4 and also any change occurring in the frequency of appearance of the periodical, should be announced clearly in one or more issues preceding the change. This announcement should be repeated on the cover or title page of the first three issues after the change.

4.7 If volumes and issues do not appear in their proper numerical order, every issue should contain prominently a list of all that has been issued.

4.7.1 If there is an interruption in the numbering this should be mentioned in a conspicuous place in the following issue (giving the duration of the interruption and the date, volume and number of the last published issue).

4.7.2 If an extra issue is published, or two or more issues are combined into a single issue, the fact should be prominently recorded in the issue in question.

4.8 If the preliminary pages and the index of a volume cannot be released with the last issue of the volume, an announcement as to when they may be expected should be made in a prominent place in that issue.

4.9 Supplements

4.9.1 Supplements, whether periodical or not, which are not intended to be bound with the main periodical, should have their own volume number pagination, title page, table of contents and index. The layout must permit that they can be separated from the main periodical. These supplements should not figure in the index(es) of the main periodical, but they may be recorded in the table of contents with a note that they are bound separately.

4.9.2 Issues containing supplements should bear, on the page specified in paragraph 2.4, an announcement of the fact, giving the volume number, issue number and pages of the supplements.

4.9.3 In the issue in which the last instalment of a supplement, or the end of a volume of a supplement, appears, the fact should be mentioned on the page specified in paragraph 2.4.

Tetrahedron Letters No.44, pp.3921-3924, 1969. Pergamon Press. Printed in Great Britain

AN ANOMALOUS REACTION IN BROMINATION OF 2-BENZYLAMINO-1-BUTANOL

Sei Tsuboyama, Akihiro Ohta and Masaya Yanagita

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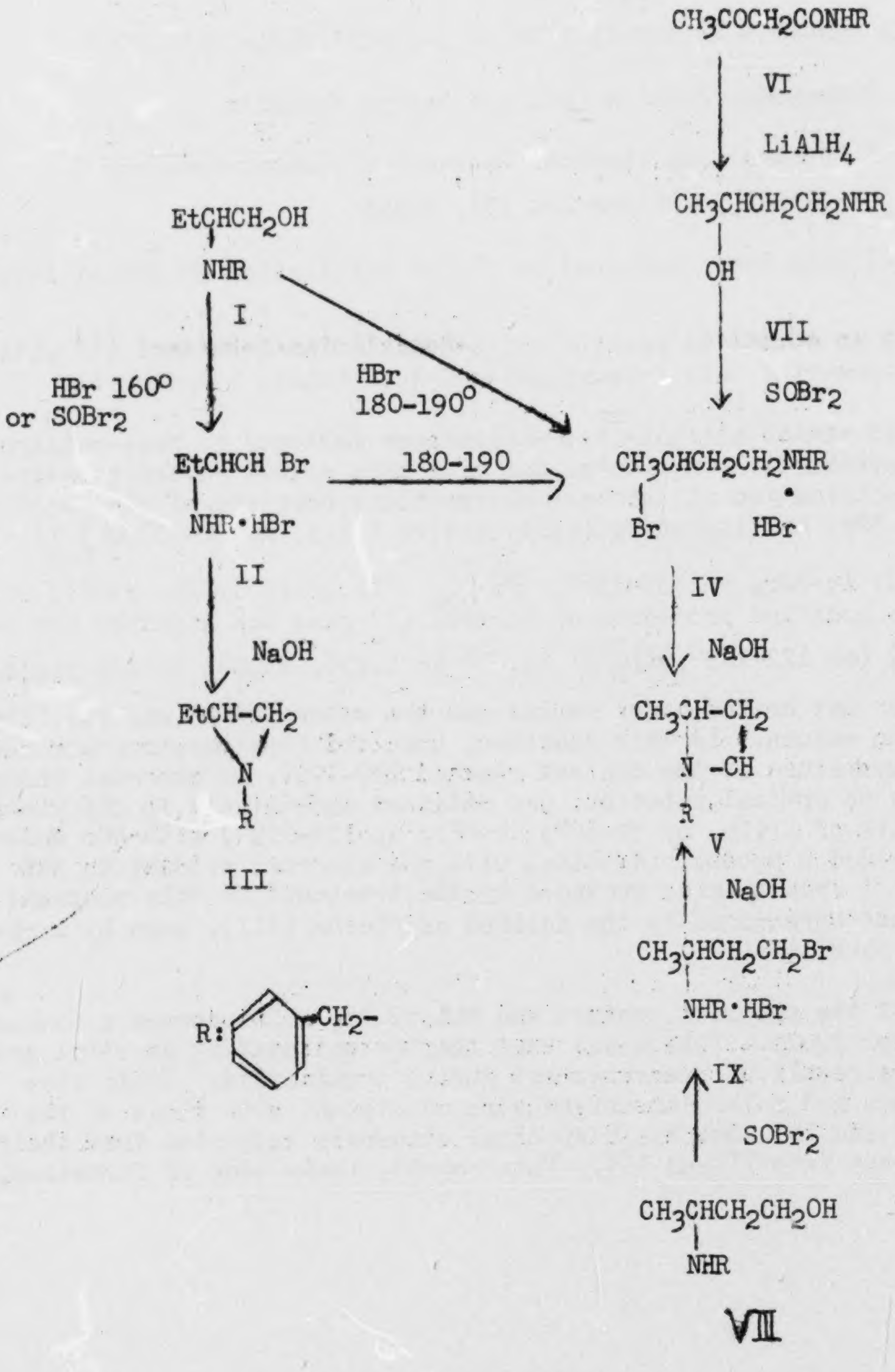
(Received in Japan 21 July 1969; received in UK for publication 20 August 1969)

We wish to report an anomalous reaction of 2-benzylamino-1-butanol (I) with HBr whereby I can be converted into 1-benzylamino-3-bromobutane hydrobromide (IV).

The conversion of β-amino alcohols to β-haloamines followed by base-catalyzed cyclization (Gabriel synthesis) constitutes one of a more useful routes to aziridines. A possible modification of the Gabriel synthesis consists of the reaction of amino alcohol with HBr. Heating of optically active I (Ia, mp 74-75°, $[\alpha]_D^{15}$ + 26.60° (c 1.015, EtOH); Ia-HBr, mp 135-136°, $(\alpha)_{300}^{25}$ + 12.4° (c 1.129, EtOH)) with 48% HBr at 160° by the modified procedure of Cortese (1) gave the expected corresponding product (IIa) (mp 122-123°, $(\alpha)_D^{20}$ + 22.07° (c 1.495, EtOH)) in 22% yield. A mixture of Ia and HBr was heated under reflux and the water formed was distilled through a fractionation column. In this reaction, when the final heating was carried out until the temperature of the content reached 180-190°, an abnormal product, mp 223-225°, which had no optical rotation, was obtained exclusively in 46% yield. Reaction of the racemate of I (Ib, mp 59-60°; Ib-HCl, mp 125-126°) with HBr under the same condition yielded a product identical with the abnormal product in 38% yield, mixed mp 224°. A cyclic amine produced by the treatment of this compound with alkali also did not correspond to the desired aziridine (III), even by variation of the reaction condition.

The NMR spectra of the abnormal product and the cyclic amine showed a doublet assignable to the methyl group. This means that they do not contain an ethyl group in their structure as a result of rearrangement during bromination. Their elemental analytical values and molecular weight were consistent with those of the expected compounds, II and III, but their spectral evidences suggested that their structures were different from II and III. This result, their mode of formation,


CH3COCH2CONHR
VI
LiAlH4
CH3CHCH2CH2NHR
OH
VII
SOBr2
EtCHCH2OH
NHR
I
HBr 160°
or SOBr2
HBr
180-190°
EtCHCH Br
NHR·HBr
180-190
CH3CHCH2CH2NHR
Br
HBr
II
NaOH
IV
NaOH
EtCH-CH2
N
R
III
CH3CH-CH2
N -CH
R
V
NaOH
CH3CHCH2CH2Br
NHR·HBr
IX
SOBr2
CH3CHCH2CH2OH
NHR
VIII
R:
CH2-

DIRECTIONS FOR AUTHORS OF "GANN"

1. Synopsis

All manuscripts must be accompanied by a short synopsis of the work described in the text.

2. Text

All manuscripts must be typed double-spaced on a good quality paper of international size ($8^{1}/_{2}\times 11''$), using a black ribbon and pica type, if possible. Top pages and not carbon copies should be submitted. Leave 1-inch margins at both sides and $1^{1}/_{2}$-inch margin at the top and bottom.

Tables and figures must be typed on a separate sheet but pages should be numbered consecutively, including tables, figures, and legends for photographs.

3. Nomenclature

Names of chemical compounds should conform to the I.U.P.A.C. nomenclature. Do not use trade names or proprietary names, but where this is necessary, add chemical name in parentheses. Trade names, if used, should be began with a capital letter and name of the producer placed in parentheses immediately following such a name. Chemical structure, if used, must be drawn clearly, with all necessary double bonds and valence bonds indicated clearly.

4. Abbreviations, Units of Measurement, Signs

Do not use abbreviations for ordinary words. Abbreviations for biochemical names are allowed only for those usually used in biochemical literature as designated by I.U.P.A.C.

Use units of measurements usually employed in medical literature. Any new units or symbols should be explained in the text. All units of measurement should be in centimeter-gram-second (cgs) and temperature in degrees Centigrade (but do not place C after the figures). Omit periods after units of measurement. Use percentage sign (%) and not per cent or percent.

All symbols used must be those usually understood and used in science.

5. Literature References and Footnotes

Reference to authors should be made by the surname (family name) in the text, with a superscript number (with closing parenthesis). If the name or names need not be given, the superscript number alone may be used in the text. Literature references should be listed on a separate sheet at the end of the text with author names listed in the alphabetical order of the name of the first author. (This number appears as the superscript in the text so that the numbering in the text will not be in regular order.)

Reference to journals should be written in the following order: Family name of the author, initial(s) of the given name(s)., abbreviated title of the journal, volume number (underlined for boldface letters), first page number of the article and year in parentheses. Thus:

1) Amolsch, A. L., Arch. Pathol., 24, 777 (1937).
2) Duncan, A. S., J. Obstet. Gyneacol., 60, 87 (1953).

....

8) Prior, J. T., Stoner, L. R., Cancer, 10, 957 (1957).

Separate the names of authors by commas and do not use any conjunction (and, und, et). In the case of a large number of authors, the second and thereafter may be omitted and *et al.* used.

Reference to books should be written likewise, with the name of the book (not to be abbreviated) placed in quotation marks, and name and address (name of city) of the publisher placed at the end. Thus:

4) Macgregor, A. R., "Pathology of Infancy and Childhood," p. 505 (1960). E. & S. Livingstone, Edinburgh.
7) Eitel, H., "Die heterogenen schmelzgleichgewicher Silikatischer Mehrstoff Systeme," p. 9 (1945). Barth, Leipzig.
12) Willis, T. A., "The Spread of Tumors in the Human Body," lst ed. (1952). Longmans Green & Co., London.

All journal abbreviations should follow the system given in Excerpta Medica or Chemical Abstracts. When in doubt, spell out the whole name so that the editorial staff can make the correct abbreviation.

When the same author is quoted consecutively, do not repeat the author name but use *Idem.* For the same journal names repeated consecutively, use the abbreviation *ibid.* (=*ibidum*).

All footnotes are to be indicated by an asterisk (*) in the text, followed by superscript numerals in the order of appearance if more than one (*1, *2, *3, ...). The footnotes should be typed at the bottom of the page where the asterisk appears in the text, preceded by an asterisk and reference number (*1, *2, *3, ...).

6. Photographs and Graphs

Photographs should be printed on a glossy white paper, with a strong contrast, in sizes up to 12 × 16.5 cm.

Graphs should be drawn on a tracing paper of graph paper with light blue lines, in black ink. Give the description and units for each abscissa and ordinate. All graphs are numbered consecutively in arabic numerals, thus: Fig. 1, Fig. 2, ... All figures must have a title.

7. Proof Reading

First page proof will be sent to the first author who should go over the proof carefully, especially for figures and literature references. Do not make new insertions in the text at the time of proof-reading.

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TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

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PRINTING TECHNIQUES IN DOCUMENTATION

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SECTION 1 REPROGRAPHY in documentation

INTRODUCTION

When documentation activity in an enterprise was subjected to discussion, the attention was apt to be focused only on the system of the documents department in the past. But, if one hopes for its more vivid activity and thinks of a plan for future development, he cannot limit his ideas as to look at the situation as problems of an independent department. He must not only look at it from a viewpoint of communication with consumers, but must also check it with knowledges on computer, printing, copying, microfilm, etc., possibly together with each specialist, on the basis of inter-relational cooperation of each field, in order to establish a future plan. (Figure-1)

Table-1 shows the materials dealt with in the documents department of IHI, as an enterprise. (Table-1)

We will hereunder discuss about how reprography, among these materials, is made, showing some examples, so as to check the problems now in exist and to review the future possibilities. These are, however, a few representative examples and not all the case. (Table-2)

These are also reviews prospected at the present stage, and we must always be prepared to cope with the technological advances and/or changes in the future.

CHAPTER 1 - TECHNOLOGICAL ORGAN

The purpose of publishing a technological organ is to announce to the public the results of researches or newly developed technics and have the general public evaluate correctly the technical standard attained by the company. It aims at PR effects of the technical side as well as exchange of information with other organizations in Japan and abroad.

Its editing plans are decided by an editorial committee consisting of representative staff from business department, etc. in the company.

Based on these plans, approaches are made to writers, and manuscripts are submitted after obtaining the approval of respective superior officer. These manuscripts are looked over by the editorial staff for rewrite if necessary, and once returned to writers for special instructions and confirmation of revisions. Also, attentions are carefully paid to preparation of cover, composition of essays, summarizing records, classification, translations into English, etc., from the editorial technics and advantages to subscribers.

Printed forms are sought after high appraisal from subscribers here and abroad, so that the best printing method is applied, such as multi-color printing on art paper for the cover, typography for the contents, offset in color for advertisement, depending upon each purpose. For this reason, more than six months are spent from the time the editorial plans are set to the actual publication. (Table-3)

CHAPTER 2 - INFORMATION WEEKLY

Each department of the company obtains or creates the first hand information. These informations are utilized constantly by the research staff or designers of the company. In order to promote the availability of such informations, Information Weekly is published on every Monday for circulation in each department of the company.

The purpose of this publication is to make available new informations as early as possible. Contents have varieties (as shown in Table-2 (2)), and the forms of printing change case by case.

Informations already "Input" in the computer are shown in Table-2, and more informations will be "Input" as much as possible in the future.

CHAPTER 3 - INFORMATION ON LITERATURE

Magazines, reports, etc. which are received by the company are registered with the Center as soon as receiving procedures are over. They are sent to about 150 checkers (persons to cooperate in selecting information), for picking up the useful informations, which are then entered into the Input Sheet shown in Figure-3.

The Input Sheet gives directions for necessary works such as copying, while on the other hand pass on the informations to computer.

These informations are once a week "Output" and reported in Information Weekly, the names of the literatures being categorized with index list of key words.

Furthermore, once in three months, letting each department designate categories which they desire to have, S.D.I. List (Selective Dissemination of Information) is prepared to be distributed among them. We further plan to do SDI Service based on key words designated by each department once a year. (Figure-4)

Q&A is not as yet in practice because the accumulation of informations is less, but this system will be put in use when 10,000 - 20,000 informations are accummulated.

CHAPTER 4 - INTEROFFICE TECHNICAL INFORMATION (IDS)

What we call "Interoffice Technical Information" in its wide meaning and is under custody includes research reports, IDS, IS and travel reports. We explain about IDS representing this group.

According to the operational control regulations of the company, the employees who prepared a technical report are bound to register the report as IDS (IHI Engineering Data Sheets). Figure-5 gives the typical examples of such cases, but their characteristics and contents cover quite extensive fields.

There are no specific limitations in its publication, and anyone at any time can make its publication, only provided that the publication uses the cover illustrated in Figure-5 and the original is sent to Documents Center without fail.

The Center reports its summary in Information Weekly, while on the other hand the information is "Input" in computer for accumulation. The original is filmed on 16mm roll film, and will be reserved for ever in a custody warehouse of constant temperature. Copy roll films in a caset form are made available to Centers and sub-Centers in each business office for making useful to general employees with the use of reader or printer. In the publishing department of IDS, print roll films are made into FISHE of Jacket system for feed back.

CHAPTER 5 - CONTENTS SHEETS SERVICE

The Center receives at present 613 Japanese and 573 western magazines. A survey has already been made as to the kind of contents service required by each department of the company. As soon as the receiving procedure of the magazine is over, a small sheet of paper printed with "Magazine No. and Name of Magazine", "No. of Department Requiring Contents Service" and "No. of Copies to be distributed" is paste upon the index of the magazine and make its second original by Xerox. Further copies are produced from this original for distribution among departments indicated on the slip. As for a future plan, essays in magazines which are deemed to be frequently used will be filled in KWIC (Key Word in Context) system of computer for use together with the present system.

CHAPTER 6 - INDEX CARDS

Books purchased by each sub-Center are informed to the Center to be published in Information Weekly. On the other hand, the Center print index cards separately for the subject, classification and author, and each sub-Center feeds back the index cards of all books equipped for the company.

These cards are at present printed by typographical mimeograph, but in future it will be included in the mechanization plan of the overall controlling system, and a method will be studied to "Output" them by computer.

CHAPTER 7 - FUTURE PLANS

To make available any and all information outside and inside of the company to anybody who needs it at any place, these informations must be centralized and put in custody which can answer such requests immediately.

For this purpose, the network system of the organizational set up and "On Line" system of computer must be materialized. In September next year, UNIVAC 1108 which was installed recently, will be utilized at any place and at any end of the company activities on Time Sharing basis, and at the same time the present IR system will also be changed to Q & A system.

Another point is facilitate the early availability of the Originals. For this, setting up a micro system at each sub-Center is being considered.

There are some problems still existing in IR system in both hardware and software, and re-planning may be necessary in view of movements in and out of the company and contacts with various information institutions.

Although only technical informations are our subjects at present, we intend to handle all other informations in the same manner, so that a total system to cover the entire company activities will be established in the future.

SECTION 2 REPROGRAPHY observed from controlling aspect

INTRODUCTION

Nowadays we often hear that a great change will take place in the means of copying now being used by us, that is copying machines, in the coming two years, and the entire copying system will appear quite differently. Such remarks were never heard at least until several years ago. Even the progress of reprography was only discussed within the range of improvement of the presently available machines or giving more speed to it.

Then, what is the cause for such a prediction? The answer must be systematization resulting from adoption of computers, saving of man power and advanced technics of electronic photography. Systematization has induced the study on the microfilm system and electronic copying machines have been brought to light as printers with copy-out ability. Makers of copying machines are concentrating on the development of machines in this field, and it is anticipated that many new accessory devices and automated equipments will be developed in the not too distant future.

It seems that, facing this problem of systematization, the reproduction department is trying to undergo a complete change by putting out something new to cope with the situation. In this sense, the terminology of "reproduction department" in the past referred only to "copying" arising in the course of business activities in an enterprise or to "department handling such copying" of drawings and business papers, and not much of discussions were made on the quality of copies produced, the department itself as an important business activity, or systems on which such activities will have to be based. Today, when it is said to be the age of a society of systematization or information, copying works occupy an important role in the systematization and are an integral part of information control system, and must be regarded as such. It must also be studied from the On-Line point of view. It is needless to say that the people in charge of reproduction department must be familiar with problems in all fields of copying, but also people in drawing department, information controlling department, etc. who use copying as a means, must pay attention to the movement of copying technics so that they can fully utilize these technics within the system they are in.

CHAPTER 1 - REPRODUCTION SYSTEM OF IHI

1. THE PRESENT POSITION OF THE COPYING DEPARTMENT

(1) IHI has offices in six rural districts in largely grouping. Each office has its own Reproduction Center.

The Reproduction Center, as the Central Controlling Department is equipped with various types of copying machines and engages in copying works of a large scale. Besides, many copying machines are scattered in other sections in order to make copying works on a small scale. Most of the machines equipped in these sections are Diazo Copying Machines with some Xerox machines. The Figure-8 shows the service layout of Reproduction Center in IHI.

Expenses spent by Reproduction Center of IHI amount to approximately ¥800 million a month. About 190 employees are working for the Center.

(2) Figure-9, Figure-10 and Figure-11 show the organizational chart of Reproduction Center of Technical Administration Department, which is the largest Reproduction Section in IHI.

(Reference)	Number of the staff	103
	Amount of expenses	¥403 million

2. WORKS OF REPRODUCTION CENTER

Inasmuch as IHI is a company manufacturing varieties of machines in few qualities on indent basis, an enourmous quantity of copies are produced. Most of them are drawing copies, but there are also copies of technical materials, technical references, general documents, etc.

The works of Production Center which takes care of copying mentioned above consist of the following:

(1) Diazo Copying

(2) Folding the Printed Drawings

(3) Bookbinding (for Diazo Copy)

(4) Xerox Copying

(5) Microfilming (Drawing and Document)

(6) Microfilm Reference Service (for Drawing)

(7) Microfilm Printing (Making the hard copy from microfilm)

(8) Custody of Original (Drawing)

(9) Offset Printing

(10) Using Subcontractors of Reproduction

(11) Mail Service

(12) Consultant for Reprography Technique

(Note:- Not all the Reproduction Centers cover fully the above points, but the scale of the Reproduction Centers will decide on which works in the above list they will undertake.)

3. REPRODUCTION SYSTEM OF IHI

(1) Reproduction System of IHI uses the following Reprography Technique:

a. Diazo Copy

b. Electro-static Process Copy

- indirect method — Xerography System
- direct method — Electrofax System

c. Microfilm

- Silver type
- Diazo type (for duplication film)
- Kalvar type (for duplication film)

d. "Silver Type" Photography (contract and enlarge)

e. Offset Printing

(2) Reproduction System

Cf. Figure-12

Cf. Figure-13(Microfilm System of Tokyo No. 1 Works)

(3) Equipments of Reproduction

As for reference, equipments of Toyosu Reproduction Section are detailed in Table-4.

Cf. Table-4 (Equipments of Toyosu Reproduction Section)

CHAPTER 2 - OFFICE COPY AND COST

Copying we do in our enterprise is termed "Office Copy" (see Notes below). Daily works in manufacturing companies as well as in general business companies involve the use of things copied or copying itself in some way or the other.

Different may the kind of business be, copied materials function as a medium to communicate our will, to supply necessary information, and to give instructions for the work. And, it is usual that a company spends quite a big expense (sometimes a enormous amount of expense) for it. Nevertheless, "Copy" has scarecely been discussed in its essence.

It may be because "Office Copy" has become so much a matter of daily routine to be discussed as a subject of importance, and it tends to be that the actual and substantial role played in an enterprise can hardly be grasped by other people than those in copying department or cost accounting department. It is evident that a business enterprise in the future must pay attention to a matter which is internally akin from a viewpoint of cost calculation.

Heretofore, "Office Copy" was thought to be an amatuer job when compared with that done by a specialist. In a way this evaluation was correct, but not recently when development and improvement of copying machines are phenomenal. Of course, "Office Copy" must always be evaluated in balance of cost and quality, and the enterprise will satisfy with the interior quality than the work of a specialist in these terms.

In the past 10 years, the main principle of "Office Copy" was Diazo. In the past few years, however, many new copying machines have been developed and imported to Japan. Many of them employ static electricity system. These new copying machines, together with development of other materials relative to the machines, can now be used for making master plate for printing. These machines have eliminated the segregation of definition between "Copy" and "Print". Under the circumstances, it is impossible at present to think of "Office Copy" as an entirely separate idea from "Office Print". Consequently, when we discuss about "Copy", the discussion cannot pursue the real merit of it without diescussions on its possibility for the simultaneous use with "Print", and "Print" cannot be discussed alone separately from the field of "Copy".

In touching on the subject of "Copy" in a business enterprise, we cannot, as mentioned before, neglect the balance between cost and quality.

In this sense, this report tried to make some methodical comparisons in connection with conditions and cost regarding "Copy of A4", which is most used in many enterprises today. The studies will deal with the possibility and limit of approach from "Copy" to "Print". It is hoped that this report will be useful in studying the present position where "Copy" is placed at.

* Note: - The original meaning of "Office Copy" is "Public Papers", but in this report it refers to "Copies of office papers in the enterprise. While, we use "Office Print" as simple printings done in the enterprise.

1. TYPES OF OFFICE COPY

"Copy" in general has a wide meaning. Making "Copy" from "Original" by mechanical or chemical means is "Copy" and also copies can be made by typewriter or manual transcript. The "Copy" we discuss here refers to the 1st category.

Machines themselves used for "Office Copy" have various types depending upon the sizes of papers to be applied whether it is smaller than A4 (including B4) or larger than A3. The size of the material to be copied has a great bearing. Copying machines in general have been developed for sizes smaller than B4 which is in more demand. Copying of drawings in the manufacturing companies forms a copying system different from "Office Copy" and is regarded to be a special field, although it is the same copying conceptionally.

We will discuss here sizes smaller than A4 (including B4), and the types of copying in its relation, as these consist of an important part of "Office Copy".

Here again, there are many differences between manufacturing companies and others in kinds of originals and numbers of copies. Less copies from different originals are made in manufacturing companies, and this tendency becomes more phenomenal as goes to manufacturing companies on indent basis, banks, trading companies ... Figure 14 shows the "cumulative curve of diazo copy" in IHI's Central Copy Control Department. In this department, copies are taken from the second originals, which is the fundamental policy here, while copying from opaque originals such as reference books and materials are grouped all in "Reference Materials". Also included in each copy are drawings. The features of the type of "Office Copy" as shown in this example are as follows: (Note:- An analysis as to the frequency of copying from a certain original and number of copies made, in other words, an analysis from "Original Life" should be necessary, but this is not made here.)

a. In general, number of copies made from a original is less.

(a) The average number of copies is 9 as drawings or documents. But drawings are only picked up, an average of 12 - 15 copies are made.

(b) The average number of copies made for reference books and/or materials is 3. As for the reference books, besides copies to be distributed to each department from the Reference Control Department, requests for recopy of the Second Originals of the reference books in custody are included. Copies to be newly distributed average at 5.

b. The department produces about 20,000 second original copies of reference materials a month by using Xerox type 720.

c. 50% of Diazo copying is:

Less than 15 copies in case of drawing and office papers.

Less than 3 copies in case of reference materials.

Less than 14 copies for altogether above.

This is the characteristic of "Office Copy" in IHI, but it is assumed that the other manufacturing companies are having the same pattern more or less in general.

We will now group all the enterprises into two categories:

a. companies in productive activities

b. companies in servicing activities

and study about the types of copying systems employed with reference to the numbers of copies made and other conditions from the overall viewpoint of "Copy" and "Print".

Classification between "Copy" and "Print" is becoming more and more difficult recently, due to the development of plate making ability on the part of copying machines and access of printing machines to copying machines by automation of offsetting mechanism.

In this sense, we will study how far "Office Copy" can develop to the level of "Office Print". We will take up copying from opaque originals, from the point of view of cost, because transparent (or semi-transparent) originals are usually copied first by Diazo system. (Second Originals, for easy repairs and/or additions, which are commonly used in manufacturing companies, are in many cases made from transparent originals, but they are excepted as we wish to deal the subject in more general ways). In studying copy system from opaque originals in general conception of "Office Copy", the following two purposes must be attained:

(1) What is the economic break-even point in using General Copy System, Second Original System and co-using Printing System.

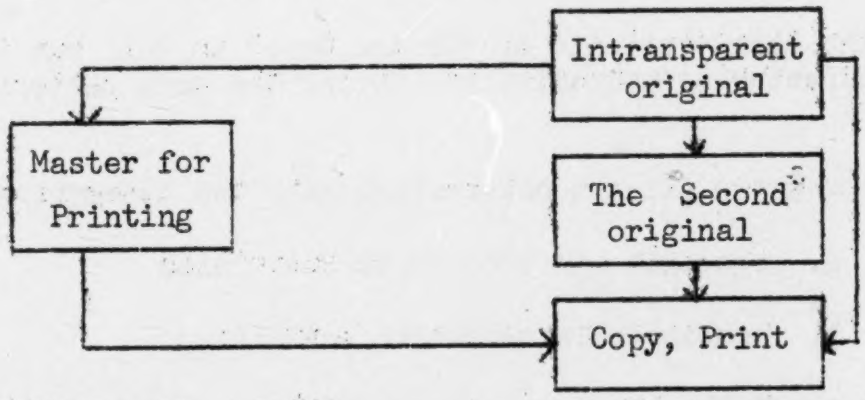
(2) Which machines will be most ideal to be used in the above Systems.

Needless to say, the above two subjects should be decided based on the type of "Office Copy" required in each enterprise, as well as on a balance of speed, quality and cost required. What is really required by "Office Copy" is "to make them better, faster and cheaper."

2. ESTABLISHMENT OF VARIOUS REPRODUCTION METHODS

First, the type of the original, number of copies to be made, and other conditions must be taken into consideration. (Note:- The presumption makes it a condition to make copy of the same size of the original and not to include the field of microfilm). These conditions change the method of application greatly, and moreover make wherever "Copy" was necessary to be substituted by "Print" or wherever "Second Original" was intended to be utilized for master plate of offset printing. The general conditions in this sense are illustrated in Figure 15.

Copying from opaque originals, which quite often becomes the subject of confusion in "Office Copy", takes the following form:



The development of copying machines from opaque originals in the past few years is very fast and many new methods are put in practical use. Many of these machines are difficult to be classified whether it belongs to "Copy" or "Print" in their original meanings. Recently a word "Reprography" is invented to cope with such a situation.

Nevertheless, we could say that most of these machines employ as fundamental system of either Diazo, static electricity, or silver chloride photostatic method, and that in most cases of "Office Copy" follow Diazo and static electricity systems.

Comparison of some of representative machines abling copying from opaque originals is given in Table - 5.

The following copying machines are selected to make comparison of reproduction capacity and cost. These machines are selected compared with others in performance ability, popularity, latent possibilities, etc.

a. EXROX 720 (Note:- This was selected as it makes copies from books)

b. Electronic Ricopy BS-320

The following two machines are listed as co-workable with XEROX 720 and Electronic Ricopy BS-320:

c.	Diazo Copying Machine	Ricopy Auto-F
d.	Offset Duplicator	Ricoh Auto-Printer 2200

Reproduction system by using these machines is shown in Figure-16.

(Note:- There are many other machines than listed above are available, but they are meant to be representative models.)

Some comments are made hereunder on each of the above machines:

(1) Xerox 720

It is well known that the machine was sold in the United States in amazing quantity and even in Japan some thousands of units are used. It boasts of the following features:

(a) Copy can be made on an ordinary high quality paper.

(b) If a correct paper is used, the copy can be used as the second original and erasing of image is also possible.

(c) Copy can be made from a book form.

(d) It has an edging effect, thereby copying of photograph is not well made.

(e) It is rented (fee is charged against number of copies).

(f) It is a Xerox's application of electro-static process copying system.

(2) Electronic Ricopy BS-320

This is a copying machine developed based on Electrofax system, and appeared in the market after Xerox. In Japan, several makers are manufacturing machines based on this principle under technical licence from RCA (U.S.A.). They are Electronic Ricopy, Elefax, Autofax, etc. There are still two systems, namely moist-system and dry-system, and BS-320 applied the latter.

The following is the features of this type of machine:

(a) Copy papers are special papers coated with zinc oxide. Any copy therefore cannot be used as the second original.

(b) It was a less edging effect, therefore,copying of photographs is made successfully.

(c) Running cost is cheaper as compared with Xerox 720.

(d) It is a general principle to prepare "General Copy (Hard Copy)", but making an offset master is possible by changing the paper. Papers of BS-320 are build into a caset.

(e) Copiable from book forms.

(f) It is an Electrofax type among electro-static copying machines.

(Note:- The difference between Xerox system and Electrofax system is that the former copies from the image formed on a selenium plate while the latter copies are taken on papers coated with zinc oxide.

(3) Diazo Copying Machine Ricopy Auto-F

Diazo copy is most popular in "Office Copy", and it has three systems in the process of developing, namely moist-process, dry-process and therm diazo process. The features of Auto-F are as follows:

(a) The originals must be either transparent or semi-transparent, because printing is done through transparent path.

(b) Its running cost is cheaper than any other machines.

(c) Diazo copy papers are already installed inside the machine, and copies can be produced by only inserting the originals.

By pre-setting the number of copies required, the necessary copies will be produced automatically, which is called "Auto System" and another system to insert the original each time for each copy are available.

(4) Offset Duplicator Ricoh Auto-Printer 2200

The offset machines available heretofore were designed for a long-run printing, involving installation of the plate, plate treatment, cleaning of blanket, etc, which are rather troublesome works. This machine has succeeded in automating all these works and can be said that it has narrowed the distance between "Offset Printing" and "Copy". It is moderately priced and the appearance of such an offset printing machine aimed for short-run operation has been very much longed for. The invention of this type of machine has changed the image we had about the offset printing machine, and we now find it available for use within the scope of our reach. The subject machine was selected as a representative model among other models available. Hereunder is the features of this machine:

a. Works from installation of the plate to printing are fully automated (automatic master loading and automatic master etching).

b. When printing is completed, the master used for the printing is automatically discharged into a tray from the cylinder (automatic master ejection).

c. By lever operation, the blanket used for the printing is automatically cleaned (automatic blanket cleaning).

d. By inputting a mark indicating the number of copies required to be printed, the Auto-Printer reads this mark automatically and produce the necessary quantity of copies. It is also possible to pre-set in the Auto-Printer the number of copies required. (The machines to make plates for the insertion of mark indicating the number of copies required are Richo Electronic Printer S-2 and Ricoh Electronic Printer V-2).

e. It only takes 30 minutes to print 30 copies each from the 50 alternative plates.

3. COMPARISON OF COST BY METHOD

Comparing cost of copying on the general conditions is a matter which is very difficult and lacks in preciseness. A precise comparison is only feasible when given kinds of originals, average number of copies to be produced, total number of sheets to be made, etc. Here, we will look for a formula of cost calculation under general conditions given in case of A4 size.

The reproduction system discussed here is just an example, and there are several other similar methods. Volume of the work will change the point of evaluation and of cost calculation. Comparison of costs was made only for reference here and it is hoped that the readers make further studies of his own based on these references.

(1) Formula of cost calculation: Cf. Table-7

(2) Comparison of costs depending on number of copies to be produced.

Costs are compared by the following different systems:

Reproduction system 1: Diazo Printing Machine Ricopy Auto-F (general copy)

" 2: Xerox 720 (general copy)

" 3: Xerox 720 (second original) + Diazo copy

" 4: Electronic Ricopy BS-320 (general copy)

" 5: Electronic Ricopy BS-320 (Offset Master) + Offset Duplicator Ricoh Auto-Printer 2200 (Offset Print)

Comparisons of costs were made on the above five systems which are shown in Table-3. Cf. Table-6 (Table of Reproduction Costs)

The above is made into a graph, which is Figure-17.

Cf. Figure-17 (Comparative Curve of Reproduction Cost)

Next is an example of producing 10 copies from one original, and the breakdown of the cost is shown in:

Cf. Table-7 (Details of Reproduction Cost)

These will give you ideas of costs of different types of copying machines. The studies were made in the above about the machines from the viewpoint of the cost. The following should be noted:

a. Reproducting the necessary number of copies from general copy will be much higher in cost than printing from Second Original by Diazo or a plate form.

b. Among other, effect of offset printing is remarkable. This was made possible with the appearance of automated offset machine. (It is a recent general tendency to connect by some means copying to printing.)

c. Electrofax system is cheaper than Xerox system (in case of General Copy). There are Electrofax systems with considerably lower installation costs. An enterrpise which does not require many copies should worth studying these types of copying machines. Of course, each model has its own features, so that evaluation cannot only be made from the viewpoint of cost. The user should study the machine from speed, quality and operation and make selection of its own.

CHAPTER 3 - A STUDY ON MOVEMENT OF REPROGRAPHY AND COPYING WORKS IN FUTURE

As stated in the introduction, we have several problems. One of them is re-organization of reproduction system in the society of systematization and application of reprography which is in progress. In this sense, we would like to make a study on the movement of reprography and how Reproduction Section must operate as we look at from Reproduction Section.

1. ANALYSIS OF THE PRESENT MARKET OF REPRODUCTION SYSTEMS

It is interesting to compare the market share of different processing systems and to know what means we are using in re-producing drawings and documents. Here, we made a comparison of the Japanese and American market. The size of the market in the United States is very big and it is said to share more than 50% of the world market. It is also said that the American trend will land in Japan in a few years, but this timing is more quickened lately. Some say that a new product made a debut in the United States market will be introduced into Japan within half a year.

American market

Office printing	47%	¥365 billion
Office reproduction	34%	¥265 billion
breakdown: EF + XEROX		88%
Others		12%
Diazo	4.6%	¥36 billion
Microfilm	10.3%	¥80 billion
Others	4.1%	¥32 billion
	Total	¥778 billion

Japanese market

FE + XEROX	42.2%	¥24 billion
Diazo	50.0%	¥28.4 billion
Printing	0.8%	¥0.44 billion
Microfilm	3.9%	¥2.2 billion
Others	3.1%	¥1.76 billion
	Total	¥56.8 billion

Characteristics of American market

(1) Office printing occupies a large portion.

In this field, Xerox 2400, 3600, and Adherography (3M) are trying to have larger market shares.

(2) Diazo printing has decreased very much, while the share of microfilm is increasing with the government's subsidy.

Characteristics of Japanese market

(1) The share of Diazo is still big.

(2) Share of printing is so small, and its further increase is feasible. But its extent will be limited contrary to the phenomena in the U.S., where typewriters are used in a sense of extention of hands while in Japan typewriting technics are still speciality technic from the reasons of difference in lettering.

(3) Share of electronic photostat especially for office use is increasing. In this field, Xerox is gaining the market in a manner to partially cover the printing field.

Also, Diazo copying machines of moisture system for office use will be taken over by electronic photostat system in the future.

(4) Microfilm is also gaining the share. It seems that the micro film industry in Japan has passed the dawn and is meeting a new age of actual use on commercial basis. As a means for controlling the huge amount of information, for control and reproduction of drawings and for custody of annually increasing documents, microfilm is the best. Heretofore, delay in the development of Output machines of hard copies from microfilm and the old fashioned sense on the part of users had been the bottle neck in expanding the use of microfilm. Information control, controls of drawings and reproduction of drawings as mentioned above are works relevant to the use of computer in the coming age, and microfilm will definitely find more market in these fields.

(Note:- In the Japanese office machine industry, in the field of copying machines, electro-static system is taking over the conventional Diazo system, offset machines for office use are increasing in replacement of printing machines, and microfilm is also gaining the market. Looking at this tendency, Japan is reforming its market in the type of American market as far as copying machines are concerned.

2. RECENT DEVELOPMENT AND PROGRESS OF ELECTRONIC PHOTOSTAT MACHINES

We now wish to discuss about the electronic photostat technics which are expected to become the main line of photocopying technics in the near future. The special characteristics of electronic photostat copying machines are attracting people's concern as Output machines of hard copy in the highly systematized copying works. The history of the Japanese electronic photostatic copying machine is only less than ten years, but its development during this period is quite remarkable. It started with importation of completed units and technics, but it now consists of the main part of the copying machines. Especially, looking at the development of new principles in the past few years, one might consider that Japan is the most advanced country in the technics of electronic photostatic copying machine. Some problems do exist still in the mechanical field, but these will sooner or later will be dissolved. Electronic photostatic copying machine will solve the problems adherent to the conventional type of copying maching in speed, saving of man power, and application for output machine from microfilm, etc.

Since Fuji Xerox produced Xerox 914 in 1962, Japan has launched into the age of electronic photostatic copying, which was followed by Ricoh with Electronic Ricopy and then by several other makers. The electronic photostatic copying machine has since gained the market steadily irrespective of use for office or for industrial purpose.

Demand has mainly increased for office use, but it is also taking over the position of silver chloride photograph and Diazo system in part in the industrial field with the development of machines of larger sizes, high efficiency and to fill the demand for Output equipment from microfilm. This tendency is becoming more phenomenal with development of new electronic photostatic copying system based soly on the local technics made since last year to this year. These new developments are made in anticipation for further increase of demand for electronic photostatic copying machines in the future and as a reaction against the monopoly of Xerox machines, aiming at cheaper installation fees and copy costs, which are welcome for us users.

The systems of electronic photostat copying now developed are as follows:

* Xerox system
* Electrofax system { Moisture type / Dry type
* NP system } - newly developed
* KIP system }

(Note:- As for sensitive materials, Matsushita Electric has succeeded in developing organic ray semi-conductor, which has greatly increased the sensitivity of copying papers in the Electrofax system.)

Following are details of newly developed machines:

(1) Xerox system

Xerox 2400 is available for rent in Japan and it aims at the result somewhere between copying and printing (2,400 sheets/h).

Xerox 3600 (3,600 sheets/h) is also under development.

S-600 will be sold from 1971. It is intended for a machine to Output from microfilm and expected to work as a machine of a system to reproduce drawings used in conjunction with microfilm.

A machine, which is called CFP, is also rented. It copies in decreasing sizes the papers punched through Output of computer.

In the United States, L.X.D. (Long Distance Xerox), which conveys copy through telephone communication wire, is also in use, but it is not introduced to Japan because of the difficulty with the Telephone and Telegraph Company of Japan.

Among other electronic photostatic copying machines now available on the Japanese market, Xerox is distinguished in the ability of copying in mass and with high speed. Xerox has many features, amongst which attention should be paid to its mechanical strength.

(2) Electrofax system

This system is mainly applied for office copying. There are many makers as the machine could be made compactly and at lower cost.

As newly developed machines, CAPS 35E, 16E are introduced as hard copy printer from microfilm.

The new movement in this system is the invention of organic ray semi-conductor. In future, the supply of cheaper copying papers is possible in replacement of silver chloride photographs (microfilm, duplicate film, etc.).

By utilizing the tensile strength of the coating, it can replace the selen drum.

The main features of organic ray semi-conductor are as follows:

a. Cost is cheaper as compared with zinc oxide and silver chloride.

b. It is a resin having high transparency.

c. Surface is smooth.

d. Coating is strong (the image can be fixed firmly).

e. Physical properties do not change by mold, etc.

f. Treatment procedure is much easier than silver.

Its applications can be made to the following fields:

a. Microfilm.

b. Micro duplicate film.

c. The field where silver chloride is used will greatly been taken over by organic ray semi-conductor.

d. Film surface is so strong to be able to replace selen drum.

e. Changes the transparent paper of zinc oxide into organic ray semi-conductor.

Sample products of microfilm and transparent papers using organic ray semi-conductor were displayed.

It is also anticipated that the manufacturers of Electrofax system copying machines may change their production to Xerox type whereby copying is possible on ordinary paper in the future.

For reproduction of drawings, Diafax model 88, an automated modification of Diafax, is put on the market.

Electrofax system is also applied in Reader and Printer from its special characteristics. It is also used for plate making for offset printing machine. The QP system lately developed jointly by Iwatsu Electric Co., Ltd. and Kusuda Business Machines Co., Ltd., and the Am-CD system of Am Company, which is said to be introduced to Japan shortly, must be interesting machines.

(3) KIP system

This is an electronic photostatic system developed by Katsuragawa Electric Co., Ltd. and is regarded as a most promissing system to compete with Xerox system together with organic ray semi-conductor. The fundamental principle of this system is called P.I.P. (Persistent Internal Polarization) and has the following features as compared with Xerox system:

a. Highly sensitive (high speed copying is possible).

b. Operation in day light is possible.

c. No edging effect is created.

d. Life of the drum is excessively long lasting.

e. Picture image is sharp.

At present, it is at the stage of test production and sales are expected to start from Autumn 1970 with the following models: KIP 1200, KIP M-600

Compared with Xerox machines, some structural defects are seen to be improved in the future with the further development of automation devices. Nevertheless, they will have a chance of becoming a strong competitor for Xerox and a threat to the conventional models of electrofax copying machines as they can make copies on ordinary papers, although at present they are on the way to completion pending solution of many problems.

(4) NP system

It is a system developed by Canon Business Machine Inc. and compact type of the machine is already on the market. It resembles in principle K.I.P. system, therefore, further explanation of this machine will not be made here.

Thus, reviewing the electronic photostatic copying industry, we see several new trends, which are very attracting. Summing up the new tendency, we may be able to state as follows what the industry is trying to reach:

(1) High speed copying - transfer to printing of small scale.
(2) Simple operation.
(3) Improvement of copied quality { use of thin paper / copying on both sides }
(4) Reduction of copy cost.
(5) One routine procedure. Copy-Binding-Book.
(6) Special fields.
(7) Combination of copying and printing.
(8) Color copy..

3. PREDICTING THE MOVEMENT OF COPYING TECHNICS

Prediction of the movement of copying technics is a very difficult thing to do. We, amateurs, never know when new copying technics will be developed. Prediction may greatly depend upon what we, users, need, mechanically or materially, in the future systematization program, and makers will set their aims accordingly.

Then, in studying what kind of machine we may need to use, the following essential points must not be forgotten:

(1) Copying machine exists not for copying itself, but as a part of a certain system. The machine to be selected must be judged from the overall view point of speed, quality and cost that this system requires.

(2) Labor cost.

Labor market will be narrowed more and more in the future and labor cost will continue to increase. For instance, if cost of one employee per minute is ¥9 - 10 and annual increase of labor cost is estimated at 13%, the cost will be doubled (¥18 - 20/min) in six years.

In considering labor cost, one may select a machine even with a little higher installation cost if it contributes to saving of labor with high productivity.

The future copying machines will fundamentally aim at the following points:

(1) Speed up (treatment, transport, IR, copy).

(2) Automation and saving labor.

(3) Cost down (idea from the total system point of view).

(4) Real Time.

(5) Color copy.

Recently, the importance of Documentation is recognized and the establishment of the system is urged. Also, in the field of designing, systematization is progressing by introducing computer for D.R. (drawing retrieval), control of work schedule, material control in factories, etc. Copying work is, therefore, regarded to have an importance as an integral part of the entire large system. Generally speaking, Diazo system will be outdated except in the field of reproduction of drawings, while the use of electronic photostat system will increase.

Microfilm will have a more demand as a media of information and drawings, and electronic photostat copying system will find more activity in the output of hard copy.

In the following, we wish to explain the process each type of machine will follow in the future.

(1) Diazo method.

This method will gradually disappear except in the field of reproduction of drawings. The machine will be more automated to save the part of manual operation. This method for office copying will be taken over by electronic photostat system with copying being made possible on ordinary papers.

Whether such tendency will materialize or not will depend greatly on the success of KIP system and organic ray semi-conductor which are being developed with local technics.

Diazo system to be continuously used in the field of reproduction of drawings will follow the following revisions:

a. Development of automation device on copying machine of large size and relative treatment procedures. - Development of the model serving as copy system which consists part of a fully automated factory system.

b. Development of color Diazo system - Recently, Mita Industry Co., Ltd. discovered a miracle color print method, but it has limits for practical use at the present stage. Printing by different wave emerged from each color could be researched in the future.

c. Expansion of use of Diazo print film as dupe film.

d. Use of Diazo sensitive materials making film as the base - Expansion of use as tools in design department, etc.

Excepting in the field of reproduction of drawings of large sizes, Diazo will hardly survive unless the manufacturers seriously study other means of use. In considering Diazo as sensitive materials, it has some superior characteristics which may be utilized in the industrial field.

(2) Electronic photostatic method.

This method will expand its market share especially in the field of office copy, and it will follow a direction of availing itself for copying on ordinary papers.

Xerox's market share at present is so big, but some other systems to compete with Xerox will find a great market. These are KIP system and organic ray semi-conductor, as mentioned before.

Electronic photostat copying equipment as an "Output" device from microfilm will be developed to find many uses, aiming at high speed, high quality and low cost. If the problem of "Output" from microfilm, which had been the bottleneck for further advance of electronic photostat system, many systems using microfilm will show great progresses.

Reproduction of drawings at the factory will become possible partially from microfilm. The second originals which are heretofore produced by Diazo system will in the future be made into tracing paper by electronic photostat. This is actually taking place already in some places. Any copying machine will find more places for work if it is so designed to be applicable in a system, departing from the fixed idea of just copying, but among all electronic photostat system has more possibilities for application as part of a system ... that is, as a device for output treatment of copy, automatic plate making machine in the printing of small scale, printer from microfilm, etc. which are already mentioned before. Makers are now concentrating on production of color copying machine by electronic photostat system, and some might have seen sample products already.

(3) Microfilm.

Until recently, 35mm film was widely used, but now 16mm film and microfishe are becoming more popular especially for information control.

In the future, microfilm and cameras which do not require development and printing will be produced for practical use. From the world wide silver shortage, the use of organic ray semi-conductor, Diazo, and other materials are being researched as emulsifier of film, and it seems that these will be commercialized in the not too distant future. At the present stage, however, nothing can compete with silver chloride in its high sensitivity and ability of image solution.

Diazo film is at present mostly used as print film but with improvement of its quality it may be used in the future for sending and dispersion of the reference materials and/or drawings.

Another angle of seeing the matter is that there will be neither documentation nor drawings system in its perfect sense as long as one original film has almighty. More use of print film must be studied where films can be handled like consuming articles.

Index machine, copying machine, transmitters, etc. will be developed in relation with this system. Transmission of micro film in information control, etc., should be an interesting subject.

A distinguished feature of the '69 Micro Show was the combination of copy and microfilm, that is so called "com system". Papers are not typed with lineprinter, and by using microfilm as a media, it intends to bring up the speed of Comp. This seems to indicate a new direction of the industry, as the case of the development of electronic photostat machines mentioned above.

(4) Other copying systems.

a. Copying by light and heat.

Dual Spectrum copying system developed by 3M is the type comes in the category of the above. It uses special middle paper and copy paper, which seems to be troublesome, but it still indicates a future direction of the industry.

In the business machine show in the U.S. last year, 3M showed a color copying machine, called Color-in-Color. Its cost is still high but color copying in the United States seems to have entered in the age of practical use.

b. The case of copying and printing.

Recently, copy machines with high speed and automatic operation have been developed to meet requirements for printing a small number of copies. The method being a little different from it, a "printing duplicator" which will simultaneously do plate making and printing was invented in the U.S. It is called "Copy-duplicator" and is a product of AM company (U.S.).

Model AM-CD2 which print 5,400 sheets/H is being tested in the U.S. and it is also said that another model capable of printing 8,000 sheets/H is being developed.

Heretofore, in the field of printing on a small scale there were plate-making and printing as two separate processes, which was as a matter of fact a feature of this type of printing. Recently, however, the industry is aiming at shortening the distance between the two processes in order to simplify the operation. They intend to change the idea of "Printing needs technics" and aim at simplicity and fastness, thus bringing the printing to the level of copying. AM-CD is really a result of such experiment. The development of this type of machine is following a process of -- development of automatic printing machine -- automation of plate-making process -- combination of plate-making and printing processes. In Japan, Ricoh's new printing system and QP system jointly developed by Iwatsu Electric and Kusuda Business Machine seem to follow a similar direction.

It is reported that the market test of AM-CD was not too appealing, but more practical type of Copy-duplicator should appear in the market in due course of time with further technical developments.

We have reviewed in the above the recent movement of the important processes of copying technics, and now come to realize that each process is at the stage of making further jump for advancement. We need to watch these movements carefully to contemplate upon the future plan of our company in this field.

4. FUTURE SYSTEMS IN RELATION WITH REPRODUCTION

The copying work must come out of the old sense of just copying things and must aim at functioning as an integral part of a system as has been said already. Even at the present stage, this tendency is quickly taking a shape. Reproduction of drawings and printing are a part of documentation, and future problems lie in how to connect such functions with other machines in a system. Even taking an example of a copying room in its narrow meaning, component machines are being systematized, such as automation of the copying machine, simplification of insertion and delivery system, automatic controlling, etc.

Three devices are often mentioned as tools for documentation, that is computer, communication equipment and copying machine. How to combine these three factors will result in a system. We will now pick up copying machine among these three items and list below other equipment which is considered to have combination potentiality:

a. Computer.

b. I.O. equipment (In-put, Out-put).

c. Facsmile.

d. Display.

e. ITV (industrial TV).

f. Data transmission.

g. N.C. Control.

Combination of the above equipment is considered to compose a system. Copying machine to be used in such a system will have to be developed to match the system.

It is already practiced in some fields to replace the drawings manually drawn by numbers designated by computer for further processings through N.C. machine or automatic drawing machine. This is an age already discussions with computer through software - Question and Answer System - will soon be put in practical use. Every work control is being centered to computer. Under the circumstances, the role of copying machine in such a system must be studies once again in order to enjoy full merit of it.

As an ideal copying machine, we look for a system where copy of original information filed in microfilm in the Center can be taken out from any local software. Looking at this from the copying machine, computer and other machines in the same system are its tools. In designing such a system, combination of Facsimile technics, display, copy machine and computer will be a key point.

5. THE PRESENT PROBLEMS OF IHI COPYING DEPARTMENT

We will in the next discuss several problems existing in the copying department in relation with copying of materials from design department which consist most of the work of copying department.

(1) The role played by reproduction department

The word, MIS (Management Information System), is often heard recently. MIS seems to have become a fashion word, but its real sense is so deep and not easily grasped. To establish an MIS system in a complete manner requires a huge amount of investment and high standard of systematization. Needless to say, the center of MIS system is computer, but in its use Japan is said to be delaying 7 - 8 years behind the U.S. Some attribute the reason of defeat of European enterprises in competition with American enterprises to delay in utilization of computer in Europe.

It is a common sense now that whether an enterprise survives in the future competition or not depends greatly on whether it will fully utilize computer or not.

Under the circumstances, computers are introduced in many fields in an enterprise to the extent of controlling design schedules, production, information, DR (Drawings Retrieval), automatic drawing machine, NC, etc. Our company is not an exception, and such high standardization of the management level stimulates a renovation in copying department, of which we are in charge. We must keep in mind that we share an important part of the above mentioned various systems and our attitude toward the work will influence greatly the future course of the company.

Recent development of various photostatic technics and of relative machinery has resulted in expansion of the field which uses such machinery. Besides, it has also promoted mechanization and systematization of copying work itself. At the same time, it has introduced new photostatic technics into design and drawing as well as into the copying work as a part of a system using computer. Reproduction department exists in between design department and production department, and plays an important role to handle "part of the production flow". It is therefore expected to create more productivity and to operate from a higher management point of view. The work of reproduction department has expanded from ordinary copying to printing and custody of drawings, and in the near future it will further expand to making copies from microfilm, reproduction of drawings in part, etc.

On the other hand, rationalization of designing and drawing is a matter is inevitable today when technical renovation is a matter of importance. In our company too, tests have been made in automatic drawing, curtailment of work process by adoption of photostatic technics, curtailment of construction period, improvement on reproduction of drawings, etc. with success.

Rationalized drawing system has close relationship with copying, use of microfilm and custody of drawings, and contributes greatly to increase efficiency. For this purpose, studies must be made on the possibility of cooperative means between design department and reproduction department so that the work efficiency is greatly enhanced.

Thus thinking, we realize more and more the necessity of having a feeling of solidarity with design and production departments, and actively challenging to development of new machines and to systems of high standard, so that the technics of copying department can be fully utilized as a mighty power of the enterprise.

We come to think of many subjects in achieving our work, and as to the way copying department should behave, but discuss below some of the immediate problems:

(2) Displaying the consolidated power by uniform controlling.

The company has many offices which are scattered, and each office has a reproduction department, which is placed under control of a variety of departments with different business scope and scale.

Estimation shows that 190 employees are belonging to copying departments of the company spending expenses amounting to about ¥800 million a year.

On the other hand, introduction of computer system in production control, in DR, etc. has brought up the level of the system with which copying is connected, and these systems themselves cannot remain to be an independent system in a business office. Once a problem arises in this system, it will certainly affect the system in the whole company. We therefore consider that it is not correct to separate the system in a business office independently. All copying departments of the company should lend their ideas each other to study and create better systems for perfect performance of business activities. Even up to now, we have exchanged opinions among reproduction departments whenever necessary, but more tight cooperation among them are henceforth required to operate our departments under a consolidated guidance in order to promote automation of copying works, saving of labor, and planning of more effective operation in order to cope with new systems of reproduction and control of drawings and DR which will develop at a faster speed with introduction of computer systems.

This idea boils down to the necessity of creating a uniform control over the entire copying departments of the company. From the organizational point of view, there may be opinions in favor of making each business office control its reproduction department independently, but on the other hand the uniform control of the entire reproduction departments will create a larger merit in fully utilizing the potentiality of the reproduction departments and at the same time fostering reproduction departments into a specialty job.

The following merits are feasible from uniform controlling of reproduction departments:

a. Strengthening the planning ability.

b. Introduction of large equipments is possible.

c. Pooling of the staff.

d. Lump purchase of materials.

e. Comparative controls.

f. Strict controlling as profit center.

(3) Importance of introduction of photostatic technics in design department.

The importance of introducing photostatic technics in the field of design and drawing has been mentioned before. These departments realizing such importance are seriously studying the case. Not only on the subjects of control of drawings, DR and new system of drawing reproduction, which are being promoted but left as pending at present, also on other themes which might arise in the future, we wish to co-study with design department and wish to offer our co-operation from the technical side of it. At present, we shoud concentrate on educating design department on new technics.

As explained above, copying department should become a pilot for introduction of new photostat technics and relative projects. Of course, reproduction department must be competent and efficient in its speciality.

(4) Promoting automation of copying work and saving of labor.

To cope with the labor shortage which is a matter of course in the past several years and high wages, and still to maintain high productivity at low level of skill, automation of copying and saving of labor is a matter to be urgently promoted. In recent years, wages of younger generations are hiked on top of the fact that labors are difficult to be gathered for kind of work at back. Investment for automation and saving of labor will result in curtailment of labor cost in the immediate future, and will open the door in the future for women laborers or part-timers to come into this type of work. An annual increase of 13% in the labor cost will double the cost in 6 years. Even in the areas outside of Tokyo where labor at comparatively lower cost is obtainable and part-timers or daily workers are easily available, labor cost will sooner or later come up. Automation and saving of labor are the most effective means to curtail the labor cost in a long run.

Our company, in cooperation with a manufacturer, tackled the problem of automating printing process of Diazo Copy since 1964, and finally succeeded in putting out Auto-F. In 1964, we started with two projects, large type and small type, and as for the large type, Ricopy PL-5000 Auto was finally displayed in the business show of last year.

PL-5000 Auto was installed one each in our business office at Toyosu, Aioi and Yokohama since August last year.

In this connection, our researches are still being continued along the development of paper folding machine, automatic insertion of originals, automatic segregation of the pictures, automatic setting of number of copies to be produced, automatic calculation of printing records, etc. which will work in relation with PL-5000 Auto. As for Auto-F, automatic insertion of originals, folding machine and Corator automatic book binding machine are being researched for development. Development of folding machine enabling book binding seems to be not so a difficult problem.

If these automation equipments are completed, we see less people in copying room.

On the other hand, the copying industry has changed greatly since 1964 when we undertook the automation plan of Diazo Printing Machine, It has now come to a stage where reproduction of drawings are to be made from hard copy produced by electronic photostatic copying machine from microfilm. Such system will be used in each business office from now on, and part of copying based on Diazo system will have to be taken over by electronic photostat system. Diazo itself will have to find its new market in the field such as automation of Auto-F and PL-5000 Auto or such as developing a color Diazo system.

The next target should be automatic "Putout" and automatic stocking of AP cards.

(5) New system of reproduction of drawings and drawings system.

The new system of drawing reproduction being used in our Tokyo No. 1 Works will indicate a future direction of photocopying. It was put in practice as a part of systematic control of production and has the following features:

a. All drawings are modified into M.F. and A.P. cards which are being pooled.

b. List up the films necessary for the construction.

c. Prepare hard copy directly from A.P. card.

d. Drawings are reproduced in reduced sizes (A3 and A4 sizes are available).

e. In future, title drawings are made blank to be modified into M.F. and necessary items will be automatically pasted as labels at the stage of Output and Input so that the drawing for construction will be produced. Employment of such new systems will greatly change the copying method

and the idea of control of drawings.

Under this system, an automation system is being tried at present by using the tape of Caps M-9. There are many other aspects requiring automation in future, for example, taking out and stocking of A.P. cards.

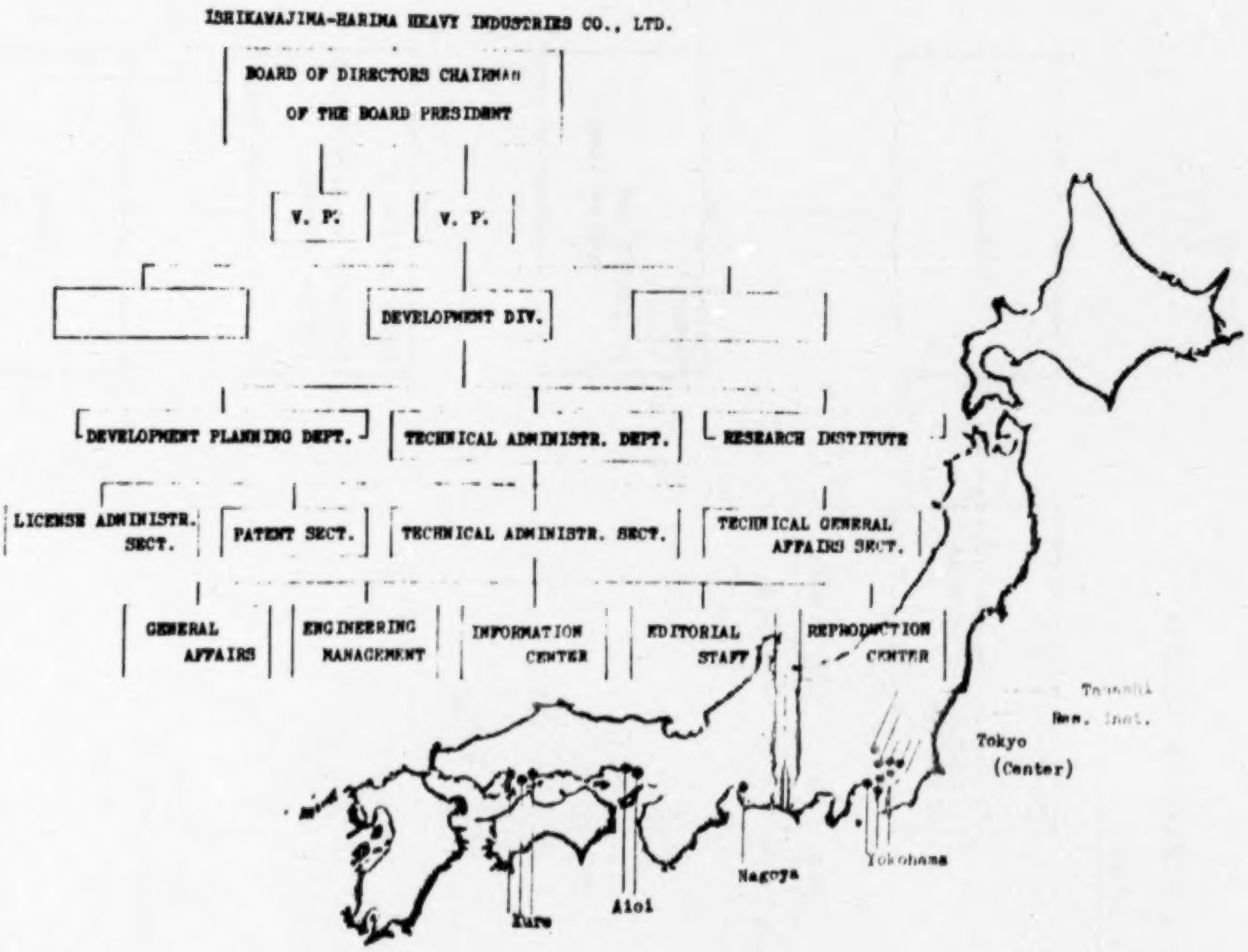
(6) There are other problems concerning improvement of tracing papers, sizes of the drawing, folding method, ways to make book-bindings, writing instruments, etc. which cannot be distinguished exactly whether they belong to design department or to reproduction department. We think that these problems will be actively challenged by us for studies and solution.

6. CONCLUSION

We have outlined in the above the recent movement of photocopying industry and directions of our reproduction department are trying to advance to. Fortunately we are living in an age of technical renovation which is progressing at an extraordinary speed, and can study many new technics. This is certainly an interesting age to live.

The copying work we have in mind might develop into something like a drawing center. There, microfilms of drawings and informations are in good custody and made available immediately to requests from design department and/or documentation center in form of a copy which is feeded back to ones who requested it. The place is equipped with the conventional types of copying machines as well as newly developed machines, and it will partially cover indexing job and copying service in general is available there. Therefore, this drawing center will most probably consist of member staff, not only from the past reproduction department but also from design department and documentation center.

Fig. 1 Network of a System


ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO., LTD.
BOARD OF DIRECTORS CHAIRMAN OF THE BOARD PRESIDENT
V. P.
V. P.
DEVELOPMENT DIV.
DEVELOPMENT PLANNING DEPT.
TECHNICAL ADMINISTR. DEPT.
RESEARCH INSTITUTE
LICENSE ADMINISTR. SECT.
PATENT SECT.
TECHNICAL ADMINISTR. SECT.
TECHNICAL GENERAL AFFAIRS SECT.
GENERAL AFFAIRS
ENGINEERING MANAGEMENT
INFORMATION CENTER
EDITORIAL STAFF
REPRODUCTION CENTER
Tanashi
Res. Inst.
Tokyo (Center)
Yokohama
Nagoya
Aioi
Kure

ADMINISTRATION OF TECHNICAL INFORMATION

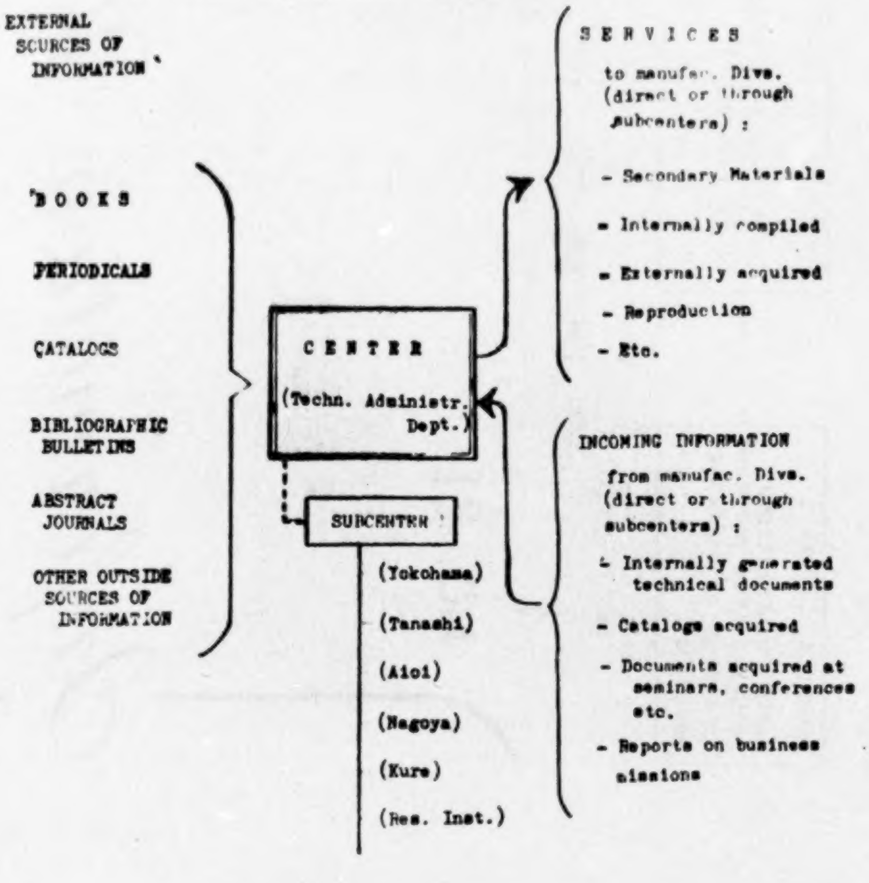
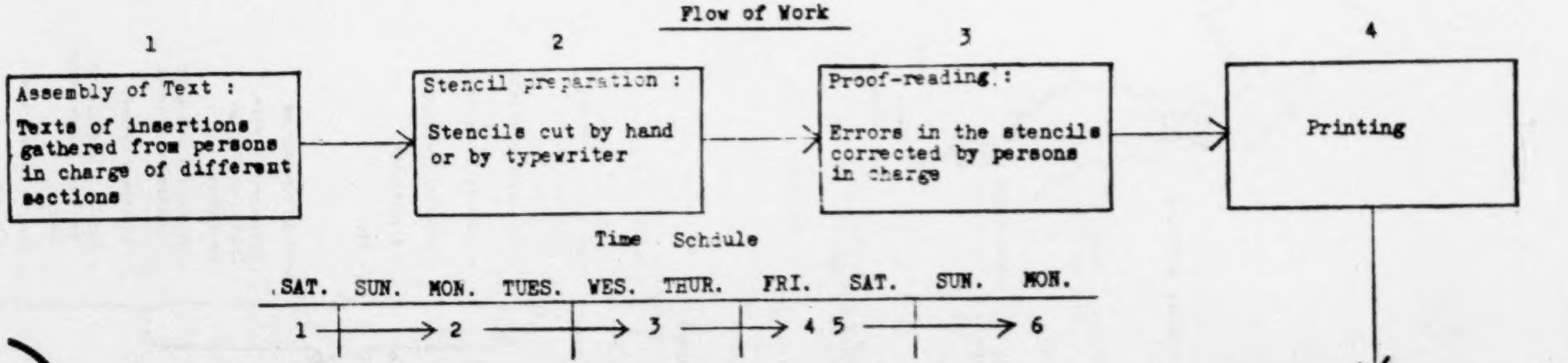
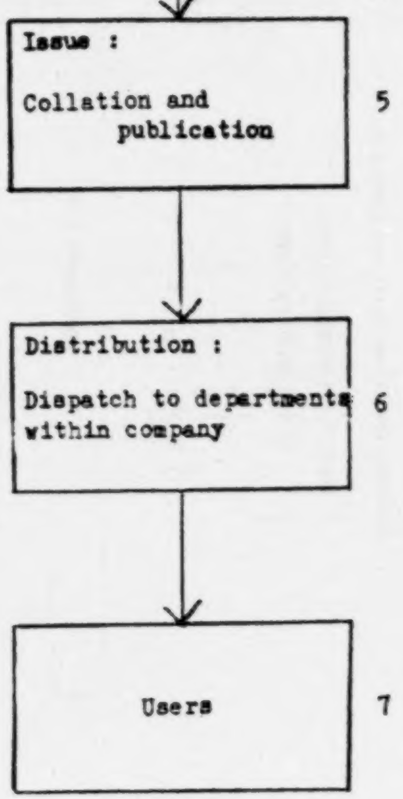
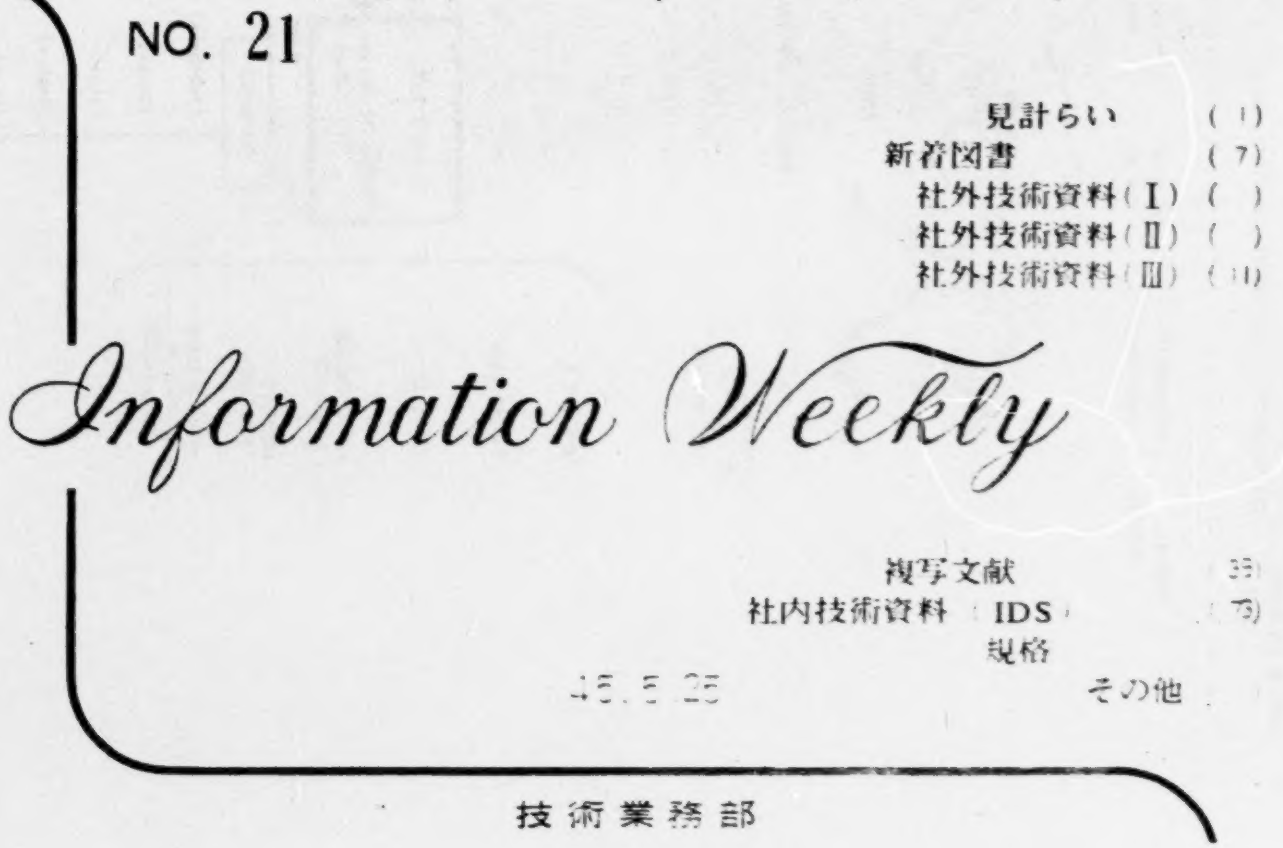

EXTERNAL SOURCES OF INFORMATION
BOOKS
PERIODICALS
CATALOGS
BIBLIOGRAPHIC BULLETINS
ABSTRACT JOURNALS
OTHER OUTSIDE SOURCES OF INFORMATION
CENTER (Techn. Administr. Dept.)
SUBCENTER
(Yokohama)
(Tanashi)
(Aioi)
(Nagoya)
(Kure)
(Res. Inst.)
SERVICES
to manufac. Divs. (direct or through subcenters) :
- Secondary Materials
- Internally compiled
- Externally acquired
- Reproduction
- Etc.
INCOMING INFORMATION
from manufac. Divs. (direct or through subcenters) :
- Internally generated technical documents
- Catalogs acquired
- Documents acquired at seminars, conferences etc.
- Reports on business missions

FIG 2. COMPILATION OF WEEKLY INFORMATION BULLETIN

Flow of Work


1
Assembly of Text :
Texts of insertions gathered from persons in charge of different sections
2
Stencil preparation :
Stencils cut by hand or by typewriter
3
Proof-reading :
Errors in the stencils corrected by persons in charge
4
Printing
Time Schdule
SAT. SUN. MON. TUES. WES. THUR. FRI. SAT. SUN. MON.
1 → 2 → 3 → 4 5 → 6


Issue :
Collation and publication
5
Distribution :
Dispatch to departments within company
6
Users
7



NO. 21

見計らい (1)
新着図書 (7)
社外技術資料（Ⅰ） ( )
社外技術資料（Ⅱ） ( )
社外技術資料（Ⅲ） (11)

Information Weekly

複写文献 (33)
社内技術資料（IDS） (73)
規格
その他

45.5.25

技術業務部

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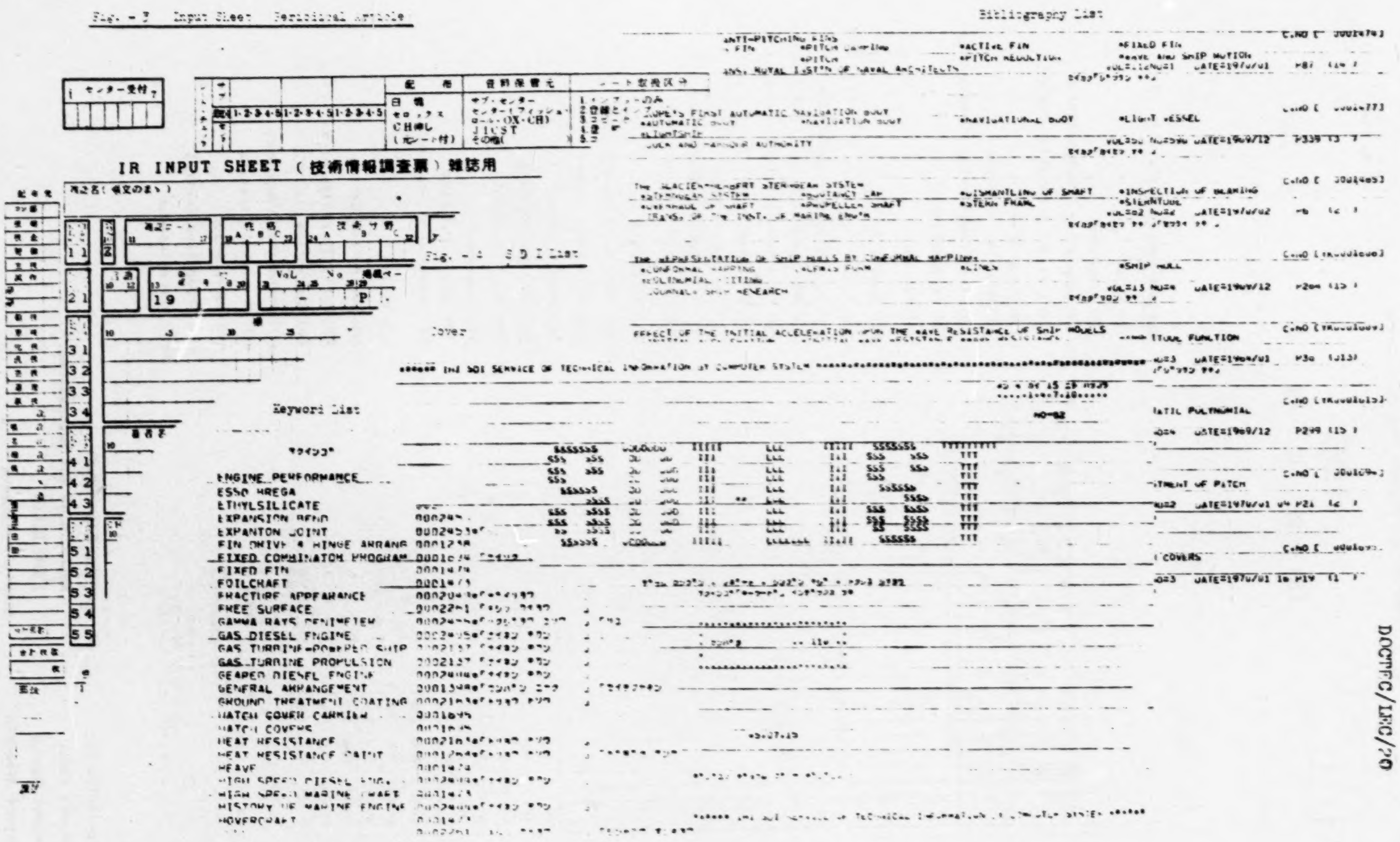

Fig. - 3 Input Sheet Periodical Article

IR INPUT SHEET（技術情報調査票）雑誌用

Fig. - 4 S D I List

Cover

****** THE SDI SERVICE OF TECHNICAL INFORMATION BY COMPUTER SYSTEM ******

Bibliography List

ANTI-PITCHING FINS

*FIN *PITCH DAMPING *ACTIVE FIN *FIXED FIN

*PITCH *PITCH REDUCTION *HEAVE AND SHIP MOTION

ANN. ROYAL INSTN OF NAVAL ARCHITECTS

EUROPE'S FIRST AUTOMATIC NAVIGATION BUOY

*AUTOMATIC BUOY *NAVIGATION BUOY *NAVIGATIONAL BUOY *LIGHT VESSEL

DOCK AND HARBOUR AUTHORITY

THE GLACIER-METALFRT STERNGEAR SYSTEM

*DISMANTLING OF SHAFT *INSPECTION OF BEARING

*STERN FRAME *STERNTUBE

TRANS. OF THE INST. OF MARINE ENGRS

THE REPRESENTATION OF SHIP HULLS BY CONFORMAL MAPPINGS

*CONFORMAL MAPPING *SHIP HULL

JOURNAL OF SHIP RESEARCH

EFFECT OF THE INITIAL ACCELERATION UPON THE WAVE RESISTANCE OF SHIP MODELS

DATE=1970/01 · DATE=1969/12 · DATE=1970/02 · DATE=1969/12 · DATE=1969/01 · DATE=1969/12 · DATE=1970/01 · DATE=1970/01

Keyword List

ENGINE PERFORMANCE	
ESSO HREGA	
ETHYLSILICATE	
EXPANSION BEND	000245
EXPANTON JOINT	0002453
FIN DRIVE & HINGE ARRANG	0001238
FIXED COMBINATOM PROGRAM	[illegible]
FIXED FIN	0001474
FOILCRAFT	0001473
FRACTURE APPEARANCE	[illegible]
FREE SURFACE	0002281
GAMMA RAYS DENIMETER	[illegible]
GAS DIESEL ENGINE	[illegible]
GAS TURBINE-POWERED SHIP	0002137
GAS TURBINE PROPULSION	0002137
GEARED DIESEL ENGINE	[illegible]
GENERAL ARRANGEMENT	[illegible]
GROUND TREATMENT COATING	[illegible]
HATCH COVER CARRIER	0001645
HATCH COVERS	0001645
HEAT RESISTANCE	[illegible]
HEAT RESISTANCE PAINT	[illegible]
HEAVE	0001474
HIGH SPEED DIESEL ENG.	[illegible]
HIGH SPEED MARINE CRAFT	0001473
HISTORY OF MARINE ENGINE	[illegible]
HOVERCRAFT	0001473

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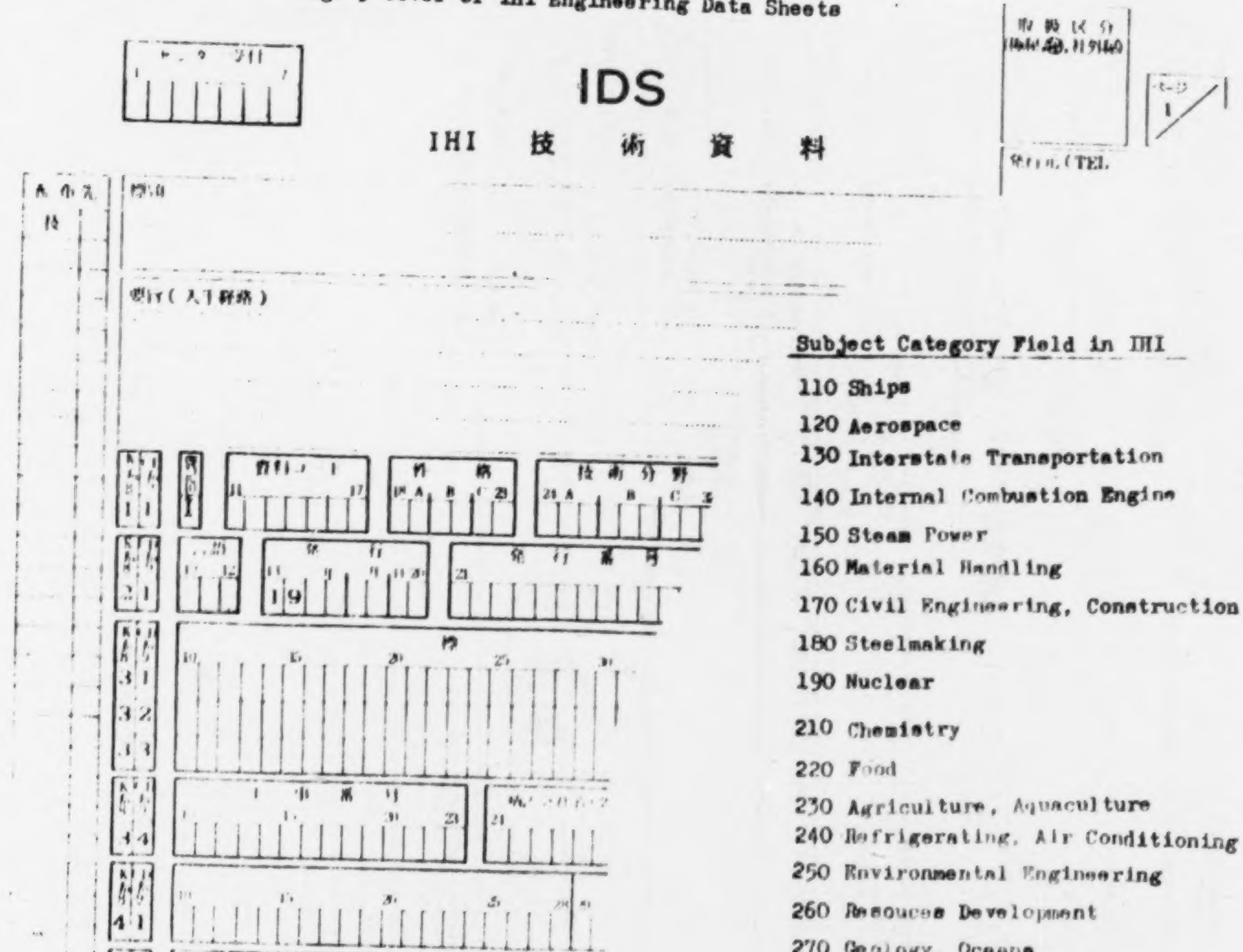
Fig. 5 Cover of IHI Engineering Data Sheets


IDS
IHI 技 術 資 料

Subject Category Field in IHI

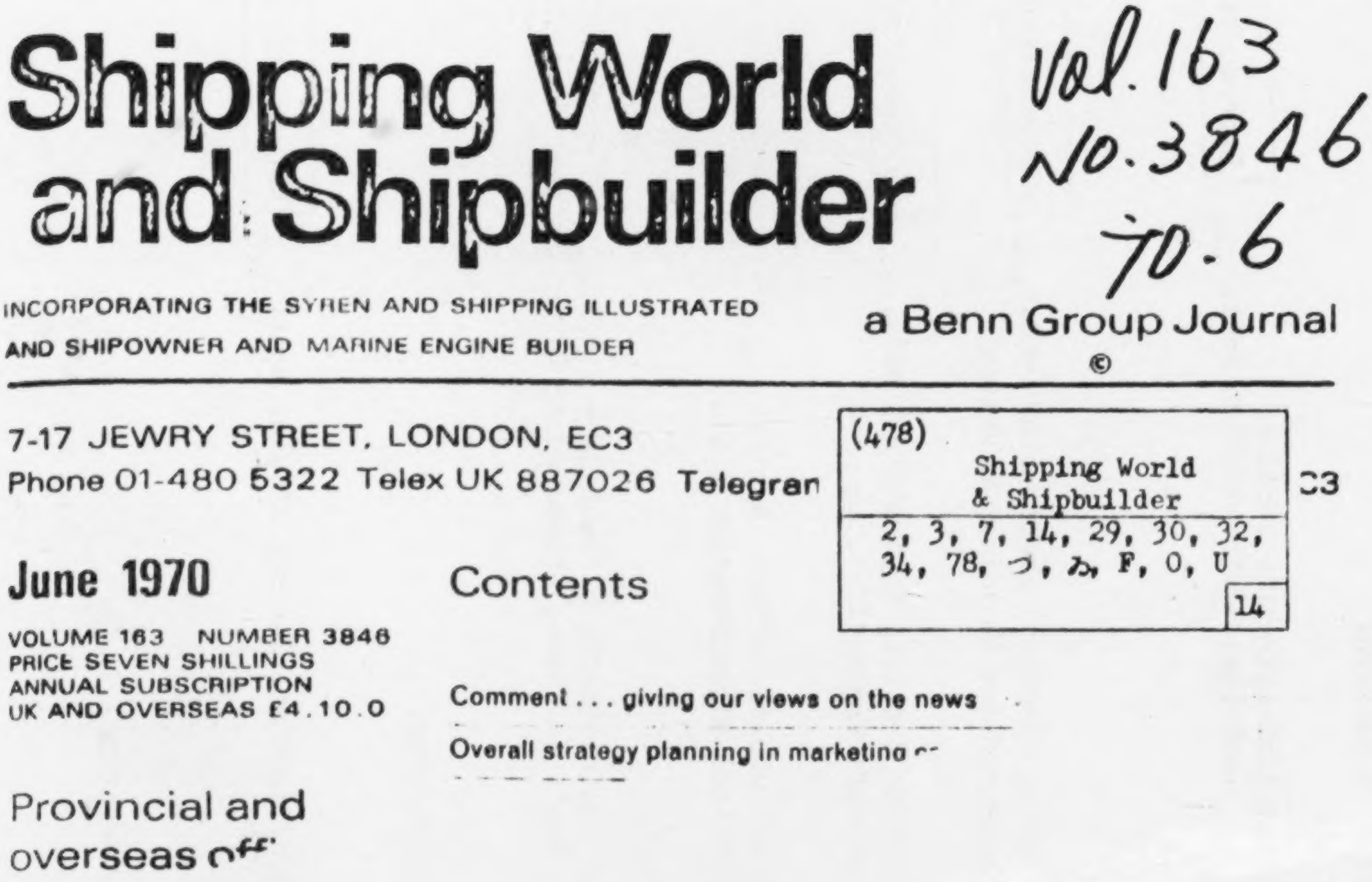
110 Ships
120 Aerospace
130 Interstate Transportation
140 Internal Combustion Engine
150 Steam Power
160 Material Handling
170 Civil Engineering, Construction
180 Steelmaking
190 Nuclear
210 Chemistry
220 Food
230 Agriculture, Aquaculture
240 Refrigerating, Air Conditioning
250 Environmental Engineering
260 Resouces Development
270 Geology, Oceans
280 Meteorology, Astronomy
290 Electrical Engineering
310 Materials
320 Structural Engineering
330 Vibration, Noise
340 Manufactures
350 Welding, Cutting
360 Heat Treatment
370 Corrosion
380 Paint, Painting
390 Measurement, Control
410 Fluids
420 Fuels, Combustion
430 Heat, Thermodynamics
440 Hydraulics
450 Mechanical Component
460 Friction, Abrasion
470 Lubrication
480 Production Control
490 Miscellaneous

Data Code

SPEC Specification
VISIT: Report Visit
DAMAGE: Report Damage
RESEAR: Report Research
MISC-R: Report Miscelaneous
CALCUL: Calculation

LITERA: Literature
RULE: Rules and Regulations
LIST: Lists
STANDAR: Standard
PROGRAM: Program of Computer
CATALOG: Catalogue

Fig. - 6 Example of Content Sheet



Shipping World and Shipbuilder

Vol. 163
No. 3846
70 - 6

INCORPORATING THE SYREN AND SHIPPING ILLUSTRATED
AND SHIPOWNER AND MARINE ENGINE BUILDER

a Benn Group Journal
©

7-17 JEWRY STREET, LONDON, EC3
Phone 01-480 5322 Telex UK 887026 Telegran

(478)
Shipping World
& Shipbuilder
2, 3, 7, 14, 29, 30, 32,
34, 78, つ, あ, F, O, U
14

June 1970

VOLUME 163 NUMBER 3846
PRICE SEVEN SHILLINGS
ANNUAL SUBSCRIPTION
UK AND OVERSEAS £4.10.0

Contents

Comment . . . giving our views on the news

Overall strategy planning in marketing

Provincial and
overseas off

Fig. - 7 Catalog Card of Books

53.092 Advances in high pressure research

Bradley, R. S.

Advabces in high pressure research,
Volume 1

53.092 London, Academic Press, 1966.
B x, 396p. 23cm
20904

¥6.000

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Fig. -8 Reproduction Center of I H I

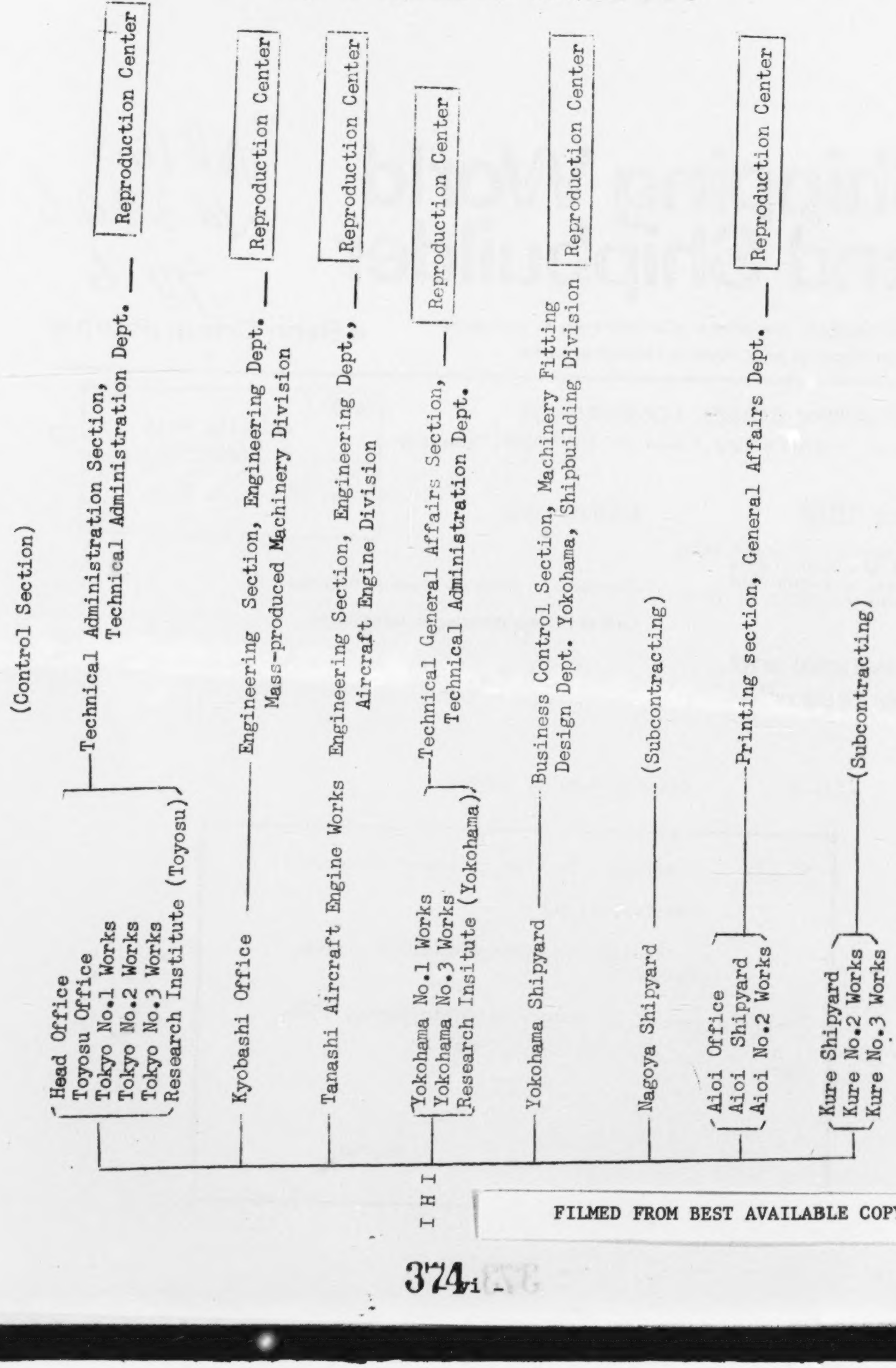
I H I
(Control Section)
Head Office
Toyosu Office
Tokyo No.1 Works
Tokyo No.2 Works
Tokyo No.3 Works
Research Institute (Toyosu)
Technical Administration Section, Technical Administration Dept.
Reproduction Center
Kyobashi Office
Engineering Section, Engineering Dept. Mass-produced Machinery Division
Reproduction Center
Tanashi Aircraft Engine Works
Engineering Section, Engineering Dept., Aircraft Engine Division
Reproduction Center
Yokohama No.1 Works
Yokohama No.3 Works
Research Insitute (Yokohama)
Technical General Affairs Section, Technical Administration Dept.
Reproduction Center
Yokohama Shipyard
Business Control Section, Machinery Fitting Design Dept. Yokohama, Shipbuilding Division
Reproduction Center
Nagoya Shipyard
(Subcontracting)
Aioi Office
Aioi Shipyard
Aioi No.2 Works
Printing section, General Affairs Dept.
Reproduction Center
Kure Shipyard
Kure No.2 Works
Kure No.3 Works
(Subcontracting)

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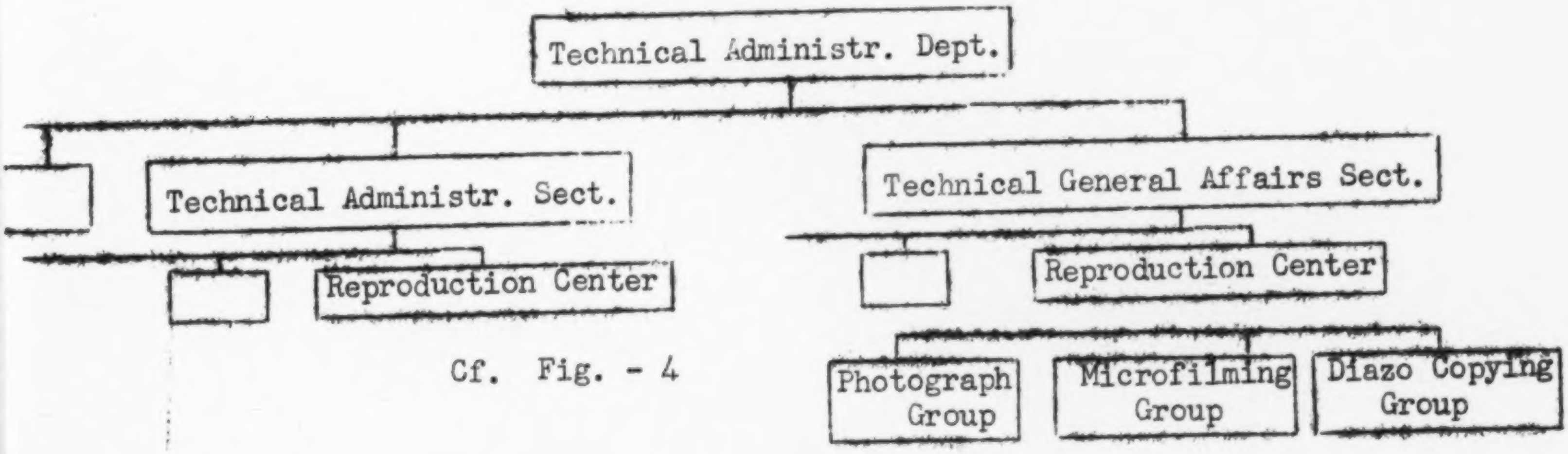
Fig. - 9 Reproduction Center of Technical Administr. Dept.


Technical Administr. Dept.
Technical Administr. Sect.
Technical General Affairs Sect.
Reproduction Center
Reproduction Center
Photograph Group
Microfilming Group
Diazo Copying Group

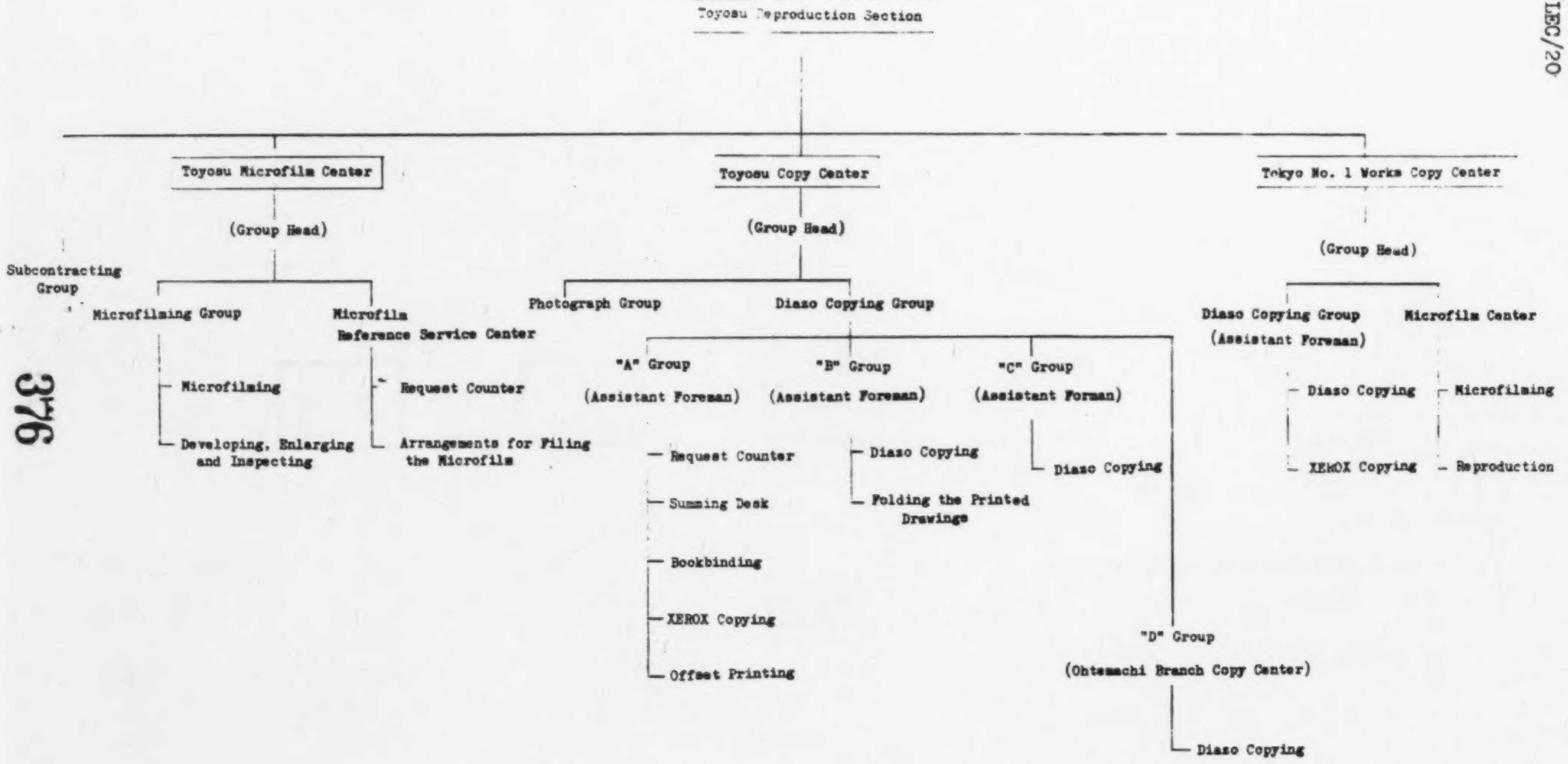
Cf. Fig. - 4

Fig. - 10 Committee for the Management of Reproduction

Technical Administr. Sect.
Technical Administr. Dept.

- (Kyobashi Office) Engineering Sect., Engineering Dept.
- (Tanashi Aircraft Engine Works) Engineering Sect., Engineering Dept.
- (Yokohama No.1 Works) Technical General Affairs Sect., Technical Administr. Dept.
- (Yokohama Shipyard) Business Control Sect., Machinery Fitting Design Dept. Yokoaham
- (Nagoya Shipyard) Business Control Sect., Ships Design Dept. (Shipbuilding Division)
- (Aioi Shipyard) Printing Sect., General Affairs Dept.
- (Kure Shipyard) Business Control Sect., Ships Design Dept. Kure (Shipbuilding Division)

Fig. 11 THE CONSTRUCTION OF TOYOSU REPRODUCTION SECTION


Toyosu Reproduction Section
Toyosu Microfilm Center
(Group Head)
Subcontracting Group
Microfilming Group
Microfilming
Developing, Enlarging and Inspecting
Microfilm Reference Service Center
Request Counter
Arrangements for Filing the Microfilm
Toyosu Copy Center
(Group Head)
Photograph Group
Diazo Copying Group
"A" Group
(Assistant Foreman)
Request Counter
Summing Desk
Bookbinding
XEROX Copying
Offset Printing
"B" Group
(Assistant Foreman)
Diazo Copying
Folding the Printed Drawings
"C" Group
(Assistant Forman)
Diazo Copying
"D" Group
(Ohtemachi Branch Copy Center)
Diazo Copying
Tokyo No. 1 Works Copy Center
(Group Head)
Diazo Copying Group
(Assistant Foreman)
Diazo Copying
XEROX Copying
Microfilm Center
Microfilming
Reproduction

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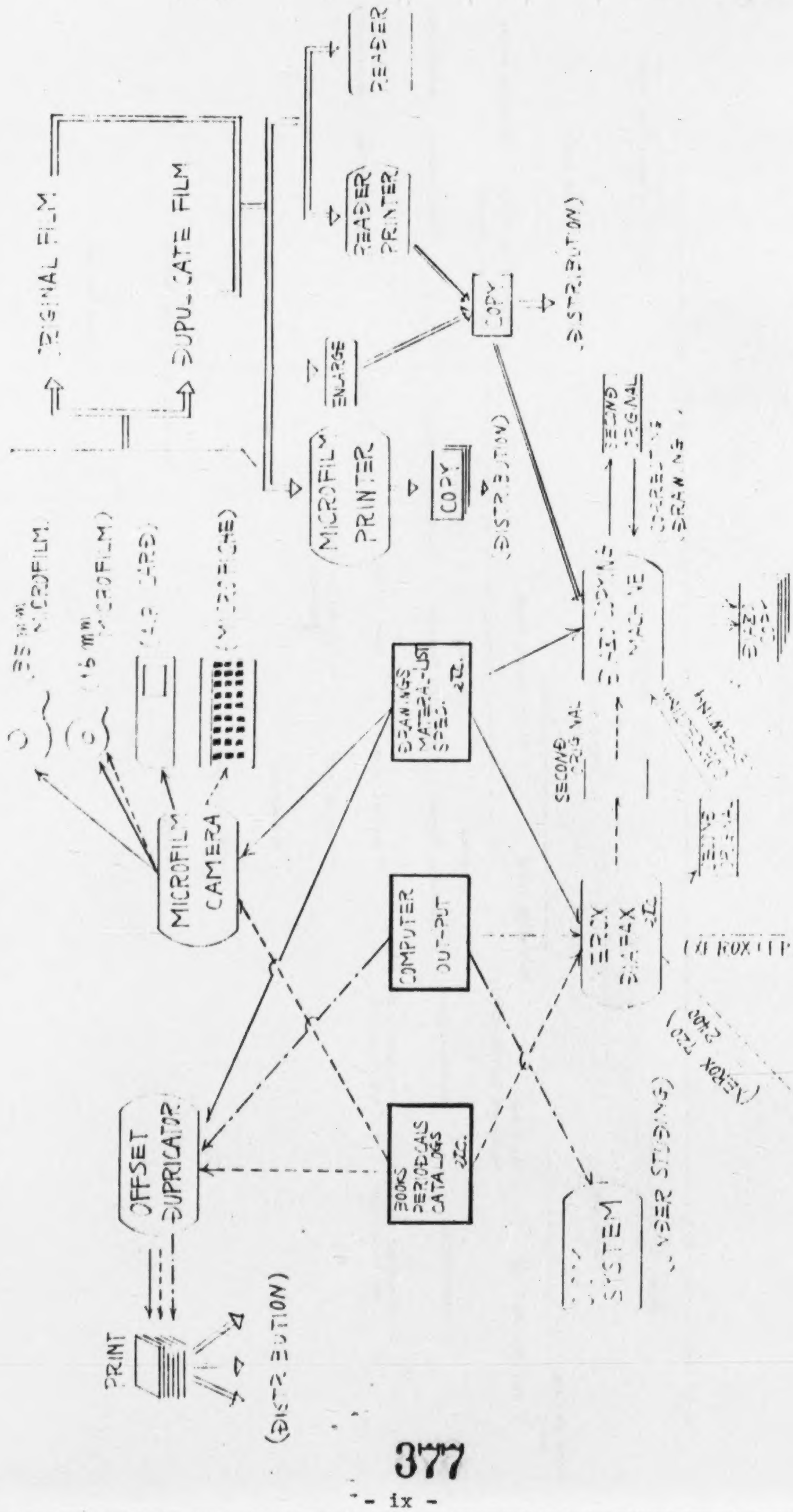
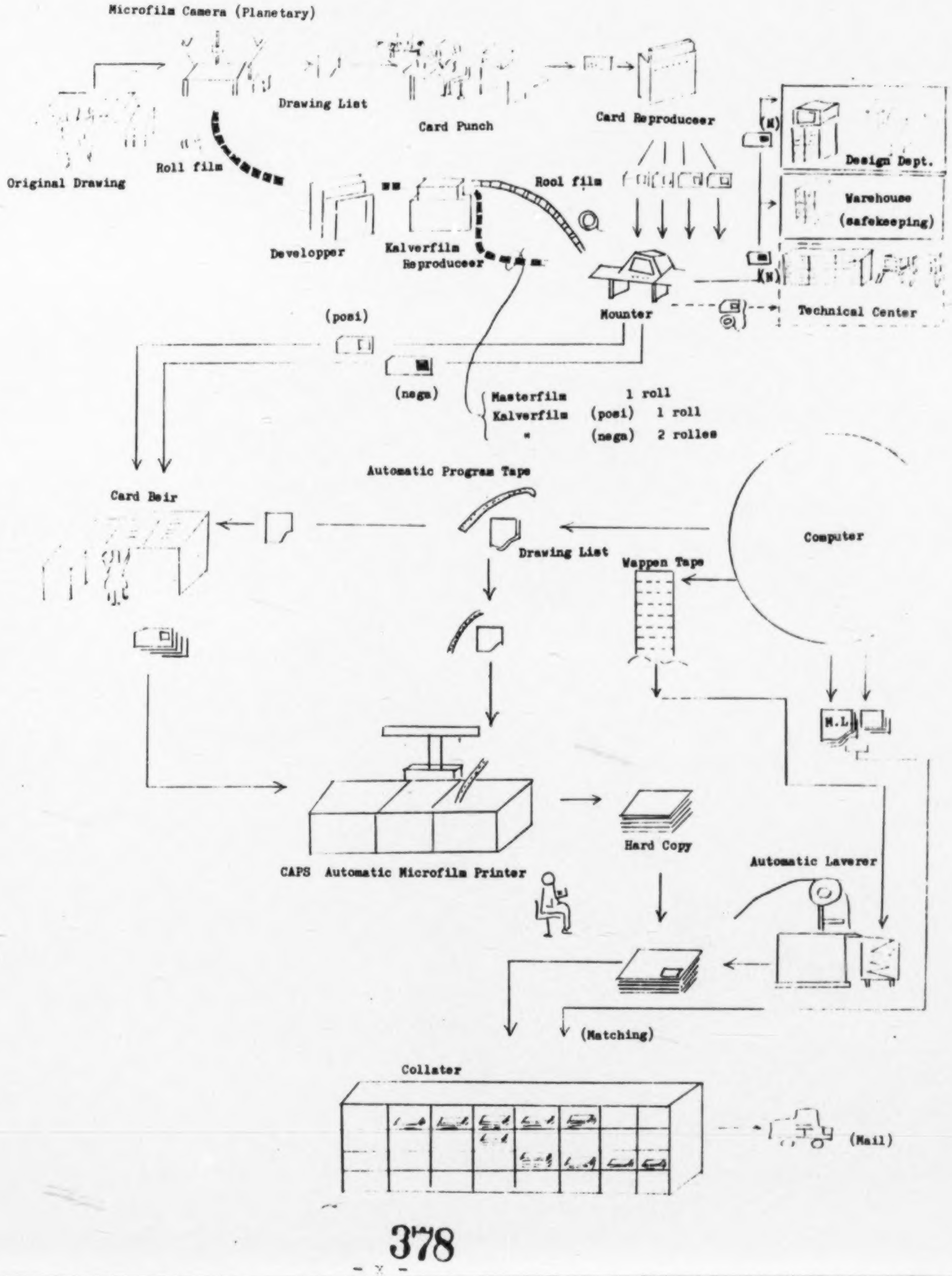

ORIGINAL FILM
DUPLICATE FILM
READER
READER PRINTER
ENLARGE
COPY
DISTRIBUTION
MICROFILM PRINTER
COPY
(DISTRIBUTION)
35 mm MICROFILM
16 mm MICROFILM
(APERTURE CARD)
(MICROFICHE)
MICROFILM CAMERA
DRAWINGS MATERIAL-LIST SPEC. etc.
COMPUTER OUT-PUT
BOOKS PERIODICALS CATALOGS etc.
OFFSET DUPLICATOR
PRINT
(DISTRIBUTION)
DIAZO COPYING MACHINE
SECOND ORIGINAL
CORRECTING DRAWING
SECOND ORIGINAL
XEROX DIAFAX etc.
(XEROX 914)
XEROX COPY
(XEROX 720 2400)
XEROX COPY
DIAZO COPY
SYSTEM
(UNDER STUDYING)

Fig. 12

Fig. 13 The Microfilm System of Tokyo No.1 Works


Microfilm Camera (Planetary)
Drawing List
Card Punch
Card Reproduceer
Original Drawing
Roll film
Rool film
(M)
Design Dept.
Warehouse
(safekeeping)
(M)
Technical Center
Developper
Kalverfilm
Reproduceer
Mounter
(posi)
(nega)
Masterfilm 1 roll
Kalverfilm (posi) 1 roll
" (nega) 2 rolles
Automatic Program Tape
Card Beir
Drawing List
Wappen Tape
Computer
M.L
CAPS Automatic Microfilm Printer
Hard Copy
Automatic Laverer
(Matching)
Collater
(Mail)

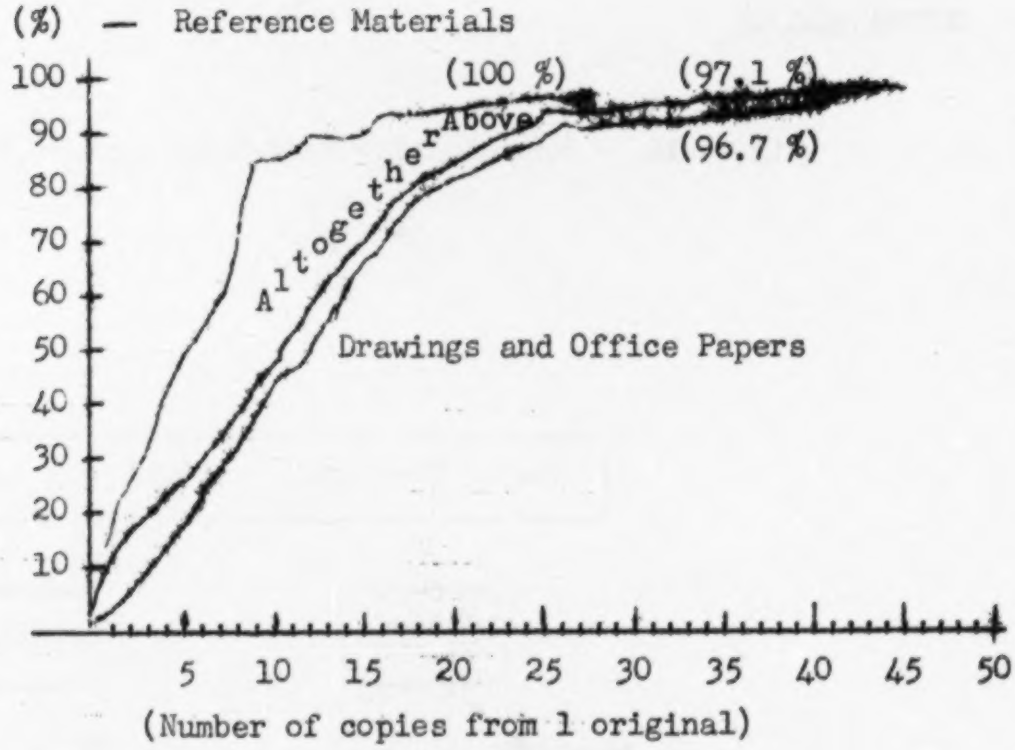


Fig. - 14 Cumulative Curve of Diazo Copy (Case of A4)

Fig. - 15 Grouping of Reproduction Items

- Original Drawing / Original Document
  - Transparent Original
    - General Copy
    - Second Original
  - Opaque Original
    - Keeping — Second Original
      - High Frequency
      - Low Frequency
    - Non-keeping — General Copy
      - Large Volume
      - Small Volume

Fig. - 16 Reproduction System in Case of Opaque Document

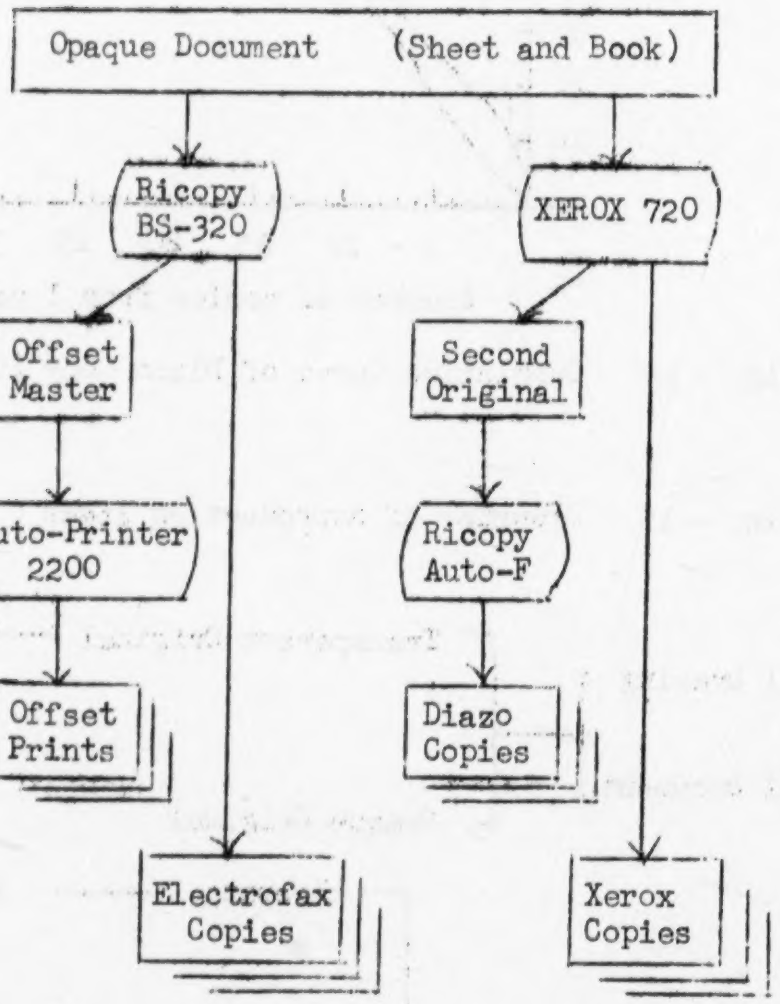

Opaque Document (Sheet and Book)
Ricopy BS-320
XEROX 720
Offset Master
Second Original
Auto-Printer 2200
Ricopy Auto-F
Offset Prints
Diazo Copies
Electrofax Copies
Xerox Copies

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Fig. 17 Comparative Curve of Reproduction Cost Reproduction Cost

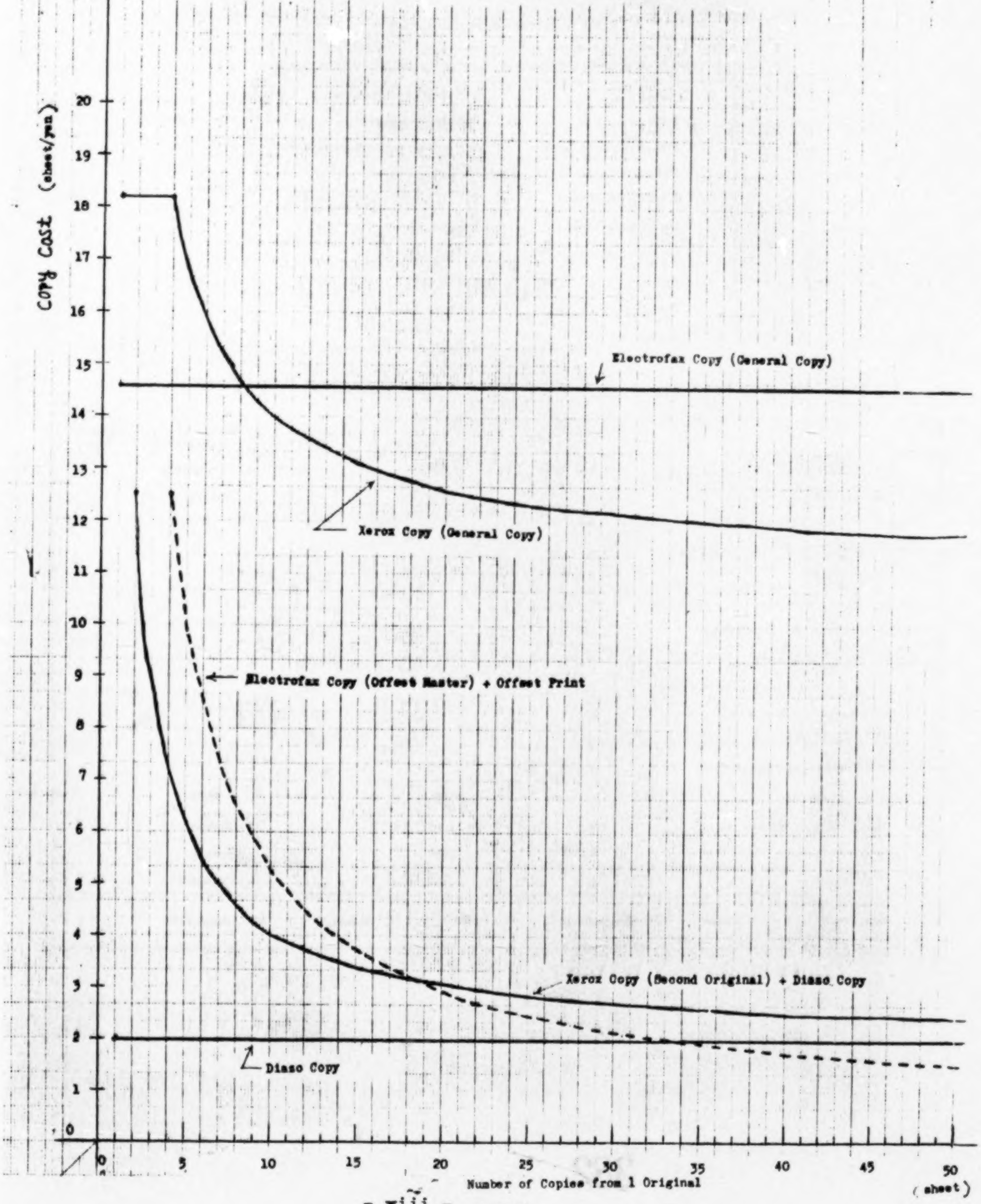

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Table - 1 Subject Matter of Documentation

Externally Acquired Information	Internally Generated Information
Periodical	I H I Engineering Rev.
Book	Research Report
Abstract Periodical	I H I Engineering Data Sheet
Abstract Card	Visiting Report
Report, Paper etc.	I H I Engineering Standard
Various Catalog	House Organ
Lecture, Meeting	I H I Bulletin
Patent	Sales Data
Standard, Rule etc.	Service News
Newspaper	

Table - 2 Various Reprography in Documentation

	Type of Reprography	Number of Copies Printed	Number of Acquisition	Number of Publication	Computer Input
(1) I H I Engineering Rev. (Japanese Edition, English Edition)	T , O	7,000		bi-monthly	
(2) Information Weekly	M , O	150		Weekly	
(2.1) New Publication Books	M		30/W		
(2.2) Recent Acquisitions Books	M		50/W		
(2.3) Publication of Society, Committee and Other Company	M , O , X , D		10/W		0
(2.4) AD, NASA, ASME, SAE, Report etc.	M , O , X , D		60/W		0
(2.5) Conference, Proceeding	M , O , X , D		5/W		0
(2.6) Periodical Article	M , O , X , D		300/W		0
(2.7) I H I Engineering Data Sheet	M , D , Mi		50/W		0
(2.8) Standard, Rule etc.	M		30/W		
(2.9) Schedule of Conference	M		20/W		
(3) I H I Research Report	M , D , Mi		50/M		0
(4) I H I Standard	O	2,000		60/M	
(5) Index Card of Books	M	10		Bi-monthly	
(6) Contents Sheets	X , D	200		Weekly	
(7) S D I List	O	250		Quarterly	0

T: Typography O: Offset M: Mimeograph X: Xerox D: Diazo Mi: Microfilm

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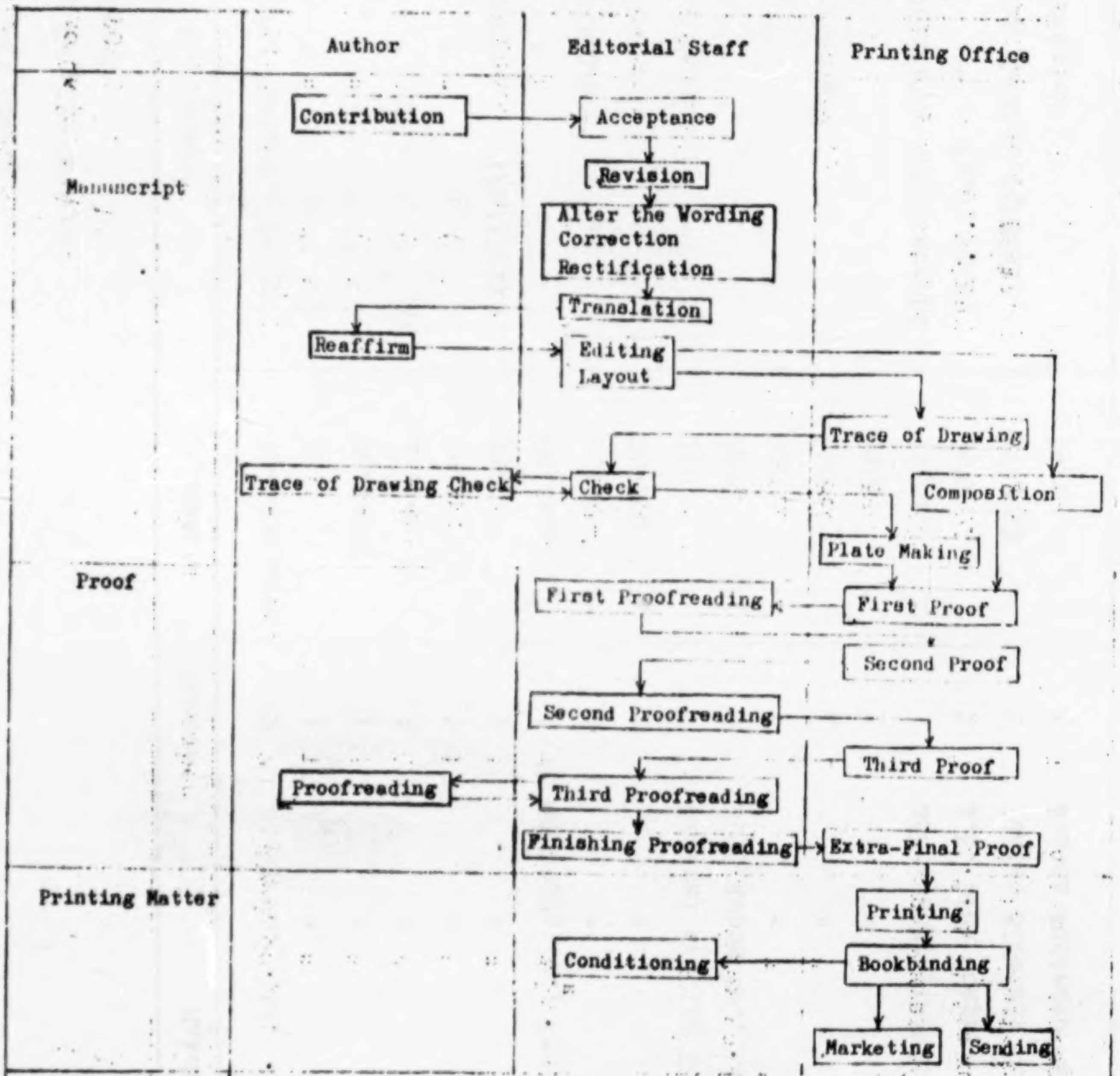
Table 3 Editorial Flow of Technical Bulletin (IHI Engineering Review)


Author
Editorial Staff
Printing Office
Manuscript
Contribution
Acceptance
Revision
Alter the Wording
Correction
Rectification
Translation
Reaffirm
Editing
Layout
Trace of Drawing
Trace of Drawing Check
Check
Composition
Plate Making
Proof
First Proofreading
First Proof
Second Proof
Second Proofreading
Third Proof
Proofreading
Third Proofreading
Finishing Proofreading
Extra-Final Proof
Printing Matter
Printing
Conditioning
Bookbinding
Marketing
Sending

Other Business of Editorial Staff

Advertisement
Contact of Author or Printing Office etc.
Charge of Sending Adress
Device of Cover Photograph or Frontispiece etc.
Construction of Sentence
Format of Bulletin

Table - 4 EQUIPMENTS OF TOYOSU PEPRODUCTION SECTION

1. TOYOSU COPY CENTER

1-1 Diazo Copying Group

1-1-1 TOYOSU

Equipment	Model	Number	Maker
Diazo Copying Machine (Ricopy)	PL-5000 Auto	2	Ricoh Co., Ltd.
" (")	PL-3	1	"
" (")	PM-810	1	"
" (")	Auto-F	6	"
" (")	CM-2	1	"
Folding Machine (Multipli)	350	1	"
"	ORi-ACe	1	Shokosha Co., Ltd.
Electric Stapler	601-B	1	"
Electric Cutter	CM-590	1	"
CBC Binding Machine	316	1	General Binding Corporation
XEROX	2400	1	Fuji Xerox Co., Ltd.
"	720	2	"
" (Rental)	660	1	"
"	1860	1	"
Offiset Duplicator (Multigraph)	1250S	1	Addressograph-Multigraph Corporation
" (A.B. DICK)	357A	1	A.B. Dick Company
Plate Making Machine (ELEFAX)	PC-301W	1	Iwatsu Electric Co., Ltd.
Electric Collater	T-16	1	Kusuda Business Machine Co., Ltd.

1-1-2 Ohtemachi

Diazo Copying Machine (Ricopy)	Auto-F	2	Ricoh Co., Ltd.
" (")	OM-2	1	"
Folding Machine	622-B	1	Shukosha Co., Ltd.
Cutter	A3	1	Michiya Co., Ltd.

1-2 Photograph Group

(Numbers of Camera)

2. TOYOSU Microfilm Center

Camera (Planetary)	MRG-1	2	Eastman Kodak Co.
" (")	MCA-0	1	Ricoh Co., Ltd.
" (")	MT-0	1	Lumo Print Co.
Prosessor	MEA-6	1	"
"	DVA	1	Eastman Kodak Co.
Reader Printer	PR-1824	1	"
"	Q2	1	Fuji Photo Film Co., Ltd.
"	Q4-AS	1	"
Reader	PA-2	1	Ricoh Co., Ltd.
"	ML-35	1	Lumo Print Co.
Enlarger	MVG-M	1	Lumo Print Co.
"	Minicopy-S	1	Fuji Photo Film Co., Ltd.
Contact-Printer	FKG-2	1	Lumo Print Co.
Film Sort Semi-Automatic Optical Mounter		1	Minnesota Mining and Manufacturing Co.

Densito-Meter		1	Macbeth Co.
Typewriter		1	Olimpia
Film Dryer	R-1	1	O.K.S. Co.
Paper Dryer	HD-1000	1	"

3. TOKYO No. 1 Works Copy Center

3-1 Diazo Copying Group

Diazo Copying Machine (Ricopy)	PL-3	2	Ricoh Co., Ltd.
" (")	Auto-F	1	"
" (")	OM-2	1	"
Folding Machine	AL	2	Shukosha Co., Ltd.
"	622-B	1	"
XEROX (Rental)	720	1	Fuji Xerox Co., Ltd.

3-2 Microfilm Center

Camera (Planetary)	L-2	1	Fuji Photo Film Co., Ltd.
Prosessor	Auto Prosessor 2	1	"
Contact-Printer (for KALVAR film)	800	1	Canon Camera Co., Ltd.
" (")	340VC,360VS	1	"
Mounter (Film Sort Hand Mounter)		1	Minnesota Mining and Manufacturing Co.
" (Itek Film Mounter)		1	Itek Business Products International Corp.
Reader-Printer	PR-1824	1	Eastman Kodak Co.
"	Q4	2	Fuji Photo Film Co., Ltd.
CAPS Automatic Microfilm Printer	M-9	1	Birch-Caps Co.
" Diazo Paper Dispenser		1	"
" Ammonia Gas Developer		1	"

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Table 5 **Comparative Table of Copy Machine**

Item \ Copy Method		Xerography		Electrofax				
Model of Copy Machine		XEROX 720	XEROX 2400R	Electronic Ricopy BS-320	" BS-220	" BS-2	Copyfax KIC-500	Elefax QP-1
Developing Process		dry	dry	moist	moist	moist	moist	moist
Maker		Fuji Xerox Co.,Ltd.		Ricoh Co.,Ltd.			Iwatsu Electric Co.,Ltd.	
Price (yen)		rental 183,600/year	rental 237,600/year	310,000	245,000	488,000	320,000	385,000
Size of Machine (W x D x H) (cm)		114 117 107	170 79 117	51.5 39.2 26.8	72.5 43.5 25.0	91.0 50.5 30.0	99.5 56.0 84.6	99.5 56.0 70.4
Weight (kg)		295	544	33	40	67	80	75
Copy Speed (seet/min.)		12	40	6	(A4)4.5	(A4)10	(A4)7	(B4)4
Original Size (min. ~ max.) (cm)		max. B4	max. B4	max. B4	max. B4	max. B4	max. B4	max. B4
Copy Size (min. ~ max.)		B5 ~ B4	max A4	B5 ~ B4	B5 ~ B4	B5 ~ B4	B5 ~ B4	A4 ~ B4
Electric Power		100V 14A	200V 23A	100V 8A	100V 9A	100V 11A	100V 11A	100V 14A
Application of Original	One Side	0	0	0	0	0	0	0
	Both Sides	0	0	0	0	0	0	0
	Transparent	0	0	0	0	0	0	0
	Opaque	0	0	0	0	0	0	0
	Sheet	0	0	0	0	0	0	0
	Book	0	Δ	0	0	0	0	0
Enlarging or Reducing		X	Δ (R...0)	X	X	X	X	X
Retouching		0	0	X	X	X	X	Δ
Making the Second Original		0	0	X	X	X	X	X
Kind of Copy Paper	General Paper	0	0	X	X	X	X	X
	Master Paper	(0)	(0)	0	0	0	(0)	0
	Tracing Paper	0	0	X	X	X	X	X
Possibility of Photograph		Δ	Δ	0	0	0	0	0
Vividness of Copy		0	0	0	0	0	0	0
Continuous Use to Offset		(0)	(0)	0	0	0	(0)	0

DOCTEC/LEC/20 Table - 6 Table of reproduction cost (yen/sheet)

G.C. ... General Copy
S.O. ... Second Original
O.M. ... Offset Master

Reproduction System \ Number of Copies	Diazo Copy	Xerox Copy (G.C.)	Xerox (S.O.) + Diazo Copy	Electronic Ricopy (G.C.)	Electronic Ricopy (O.M.) + Offset Print
	$y = 2$	$x \leqq 4$ $y = 18.2$ $x \geqq 5$ $y = \frac{28}{x} + 11.22$	$y = \frac{21}{x} + 2$	$y = 14.6$	$y = \frac{47.77}{x} + 0.549$
1	2	18.2		14.6	
2	2	18.2	12.5	14.6	
3	2	18.2	9.0	14.6	
4	2	18.2	7.3	14.6	12.5
5	2	16.8	6.2	14.6	10.1
6	2	15.9	5.5	14.6	8.5
7	2	15.2	5.0	14.6	7.4
8	2	14.7	4.6	14.6	6.5
9	2	14.3	4.3	14.6	5.9
10	2	14.0	4.1	14.6	5.3
11	2	13.8	3.9	14.6	4.9
12	2	13.6	3.8	14.6	4.5
13	2	13.4	3.6	14.6	4.2
14	2	13.2	3.5	14.6	4.0
15	2	13.1	3.4	14.6	3.7
16	2	13.0	3.3	14.6	3.5
17	2	12.9	3.2	14.6	3.4
18	2	12.8	3.2	14.6	3.2
19	2	12.7	3.1	14.6	3.1
20	2	12.6	3.1	14.6	2.9
21	2	12.6	3.0	14.6	2.8
22	2	12.5	3.0	14.6	2.7
23	2	12.4	2.9	14.6	2.6
24	2	12.4	2.9	14.6	2.5
25	2	12.3	2.8	14.6	2.5
26	2	12.3	2.8	14.6	2.4
27	2	12.3	2.8	14.6	2.3
28	2	12.2	2.8	14.6	2.3
29	2	12.2	2.7	14.6	2.2
30	2	12.2	2.7	14.6	2.1
31	2	12.1	2.7	14.6	2.1
32	2	12.1	2.7	14.6	2.0
33	2	12.1	2.6	14.6	2.0
34	2	12.0	2.6	14.6	2.0
35	2	12.0	2.6	14.6	1.9
36	2	12.0	2.6	14.6	1.9
37	2	12.0	2.6	14.6	1.8
38	2	12.0	2.6	14.6	1.8
39	2	11.9	2.5	14.6	1.8
40	2	11.9	2.5	14.6	1.7
45	2	11.8	2.5	14.6	1.6
50	2	11.8	2.4	14.6	1.5

Table - 7 Details of Reproduction Cost

(yen/sheet)

Process / Item	Diazo Copy	XEROX 720		Electronic Ricopy		Offset Print (*2)
		General Copy (*1)	Second Original	General Copy	Offset Master	
Rent		6.412	10.612			
Cost of paper	0.9	1.0	2.3	8.0	25.0	0.5
Cost of supplies	0.467	2.8	2.8	0.73	3.0	0.174
Cost of depreciation				0.451	0.722	0.069
Electric fee		0.09	0.126	0.069	0.11	0.004
Personnel expences	0.637	3.714	5.2	5.308	8.493	0.849
(Total)	(2.004)	(14.016)	(21.038)	(14.558)	(37.325	(1.596)
@	2.0	14.0	21.0	14.6	37.3	1.6
(Reference) the cost of equipment	1,300,000	(Rental)		310,000		2,950,000

*1 The unit cost is for the case of copying 10 sheets from 1 original.

*2 The unit cost is for the case of printing 10 sheets from 1 offset master. (exclusive of offset master cost)

*3 The basis of calculation
- a) Personnel expenses 130,000 yen/month
- b) Operating hours 204 hour/month
- c) Operation efficiency
  - o Diazo Copying Machine Ricopy Auto-F 1,000 sheet/hour
  - o Xerox 720
    - for General Copy 35,000 sheet/month
    - for Second Original 25,000 sheet/month
  - o Electronic Ricopy BS-320
    - for General Copy 120 sheet/hour
    - for Offset Master 75 sheet/hour
  - o Offset Dupulicator Ricoh Auto-Printer 2200 75 master/hour
- d) Efficiency rate
  - o Operating Time 80 %
  - o Copy and Print 100 %
- e) Term of depreciation 3 years
- f) Exclusive cost
  - o Expense of the operating room
  - o Money interests

ANNEX 7

Proceedings of Discussion

Distribution: limited

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Tokyo, 17 August 1970
Original: Japanese

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

Basic Guidelines on the Nation-wide System for the Flow of Scientific and Technological Information in Japan

(tentative)

——As a means for effectively communicating research results to the industry——

Introduction

The remarkable advancement of science and technology today brings about rapid developments in industrial technology, but in putting research results into practice accurate and reliable communication between research workers and management and engineers in the industry is prerequisite.

The amount of scientific and technological information is growing acceleratedly with the progress of science and technology, and the annual production of research papers, now estimated at 3 million, is expected to be doubled in 8-10 years, which inevitably requires everexpanding reconnaissance zones for retrieval of needed information, makes exhaustive collecting and processing of information more difficult. Consequently, users of information are requesting creation of effective measures which can fully cope with such a situation.

Remarkable advancement of new computer-based technologies for information processing and transfer is being materialized in advanced systems for rapid and accurate processing of information.

In Japan, the Council for Science and Technology (an advisory body to the Prime Minister, dealing with overall promotion of governmental policy for science and technology) had been discussing basic measures for the flow of scientific and technological information since March 1969, in response to Premier's inquiry. The result was reported to the Prime Minister in October, same year. In this report, a concept of nation-wide system for the flow of scientific and technological information was proposed, which was worked out with a view to finding out what a system might be necessary in order to communicate research results to users rapidly and accurately. As the chief traits of this report and the topic to be discussed here agree well, the basic guidelines for the nation-wide system for the flow of scientific and technological information will be described here, which might be helpful to examine the present topic.

1. The Concept of a Nation-wide System for the Flow of Scientific and Technological Information

S and T information are made public by quite a large number of sources, i.e., scientists and engineers, research institutions, universities, industrial companies, etc., domestic and overseas, and its quantity is extremely large and their contents and presentation forms vary fairly widely, and a series of processing and treatment such as preparation of secondary information, is required when needed information finally reaches the end user.

Moreover, the needs for information clearly show an earnest wish for rapid and easy access to necessary information put out by various organizations home and abroad.

In addition, diversification and sophistication of information needs simultaneously require diversified services ranging form general and comprehensive to specialized and individualized ones, as well as high quality of information.

In order to make flow of information smooth while meeting such requirements, it is necessary not only to strengthen individual information services, but also to link them organically to form an effective system.

At this time the entire process of collecting, processing, and distribution of information must be divided into collecting and processing function of general or specialized nature and servicing function to be stationed according to geographic distribution of users, both of them being closely linked together to form a nation-wide network.

In Japan a couple of public services such as the Japan Information Center of Science and Technology (JICST) have been set up and strengthened or are now under planning, but it was concluded that such measures are insufficient to meet overall needs under these circumstances.

Therefore the Council, in its report to the Premier entitled "On the Basic Policy of Nation-wide Flow of Scientific and Technological Information", proposed a concept of a nation-wide system for S and T information. This concept envisages a functional structure as schematized in the appended diagram. The keynotes are:

(a) to fully cope with users' needs resulting form increase of information production and diversification of needs,

(b) to give due consideration to conditions of administration within the system.

This nation-wide system, shortened as NIST, comprises the following functions:

(1) Central Coordination Function

This function will organically connect all components for effective functioning, and mainly deal with policy-making concerning the whole system, coordination of operations of individual components, clearinghouse service, a window to international cooperation, standardization within the NIST, etc.

(2) Operating Centers

The whole area of science and technology will be divided into several major subject fields, and the operating centers in each field will collect published information comprehensively and process them to make secondary information.

(3) Regional Service Centers

The function of distributing information will be borne by regional service cneters of the NIST. These centers will retrieve information obtained from operating centers and specialized ones and transfer them to terminals. It is also necessary to set up high-speed data transmission network between regional centers and operating or specialized centers for on-line communication.

(4) Specialized Centers, Data Centers

Information of limited scope directly related to specific R & D area or projects or primary and secondary information about numerical data will be collected, analyzed, evaluated, critically reviewed, and compiled to reference compendia by these centers.

(5) Terminals

Terminals are the window to give information to requesters, and those for general public will be set up at public libraries of the region.

(6) Central Depository

Out of information collected and processed by any component of the NIST, those which must be stored for longer period will be transferred to and kept here in order to reduce the bulk at working sites.

(7) Training Function

Training of personnel working for various components of the NIST and refreshing of already trained ones will be carried out.

(8) R & D Function

Research and development of techniques necessary for running NIST, i.e., information processing techniques and systems engineering, will be carried out.

Such a concept of NIST network will well illustrate basic pattern of a nation-wide system of information flow to be established by a close cooperation of the government, academic and industrial communities.

Therefore, implementation of this basic pattern into actual services shared by component organizations will constitute a large problem of the future, and the government must play a leading role in this respect.

2. The Role of the Government

As the nation-wide system of flow of scientific and technological information forms the basis for the advancement of science and technology, its implementation and effective operation will much contribute to the advancement of science and technology and promotion of the industry by making R & D efforts efficient, speeding up practical application of research results, etc.

In addition, structuring of this national system for international cooperation will also be significant. However, implementation of this plan will require time and money. Consequently, the government should play the following roles in order to push the scheme forward:

(1) Creation of an integrated planning organization

The NIST must be implemented in the framework of long-range overall project by connecting every component organically. In this respect an administrative organ must be set up in the government which will take charge of integrated planning and coordination of the whole NIST system.

(2) Establishment of implementation schedule of the NIST

In order to implement the NIST project systematically, a longrange plan must be worked out as a guideline to this effect.

(3) Fostering of individual component organizations

The implementation of the NIST requires large amount of financial resources. Components with varying functions must be set up one by one depending on needs and priority when circumstances become favorable through close cooperation of governmental, academic and industrial circles. In such a case the government should systematically subsidize each project on ground of its degree of public nature, importance, ease of setting up by non-governmental efforts, etc.

(4) Training and securing of manpower for S and T information services

To implement the NIST, qualified personnel who will mainly carry out every work must be secured. As there are very few personnel with formal education, institutions of higher education must be consolidated and training facilities repleted.

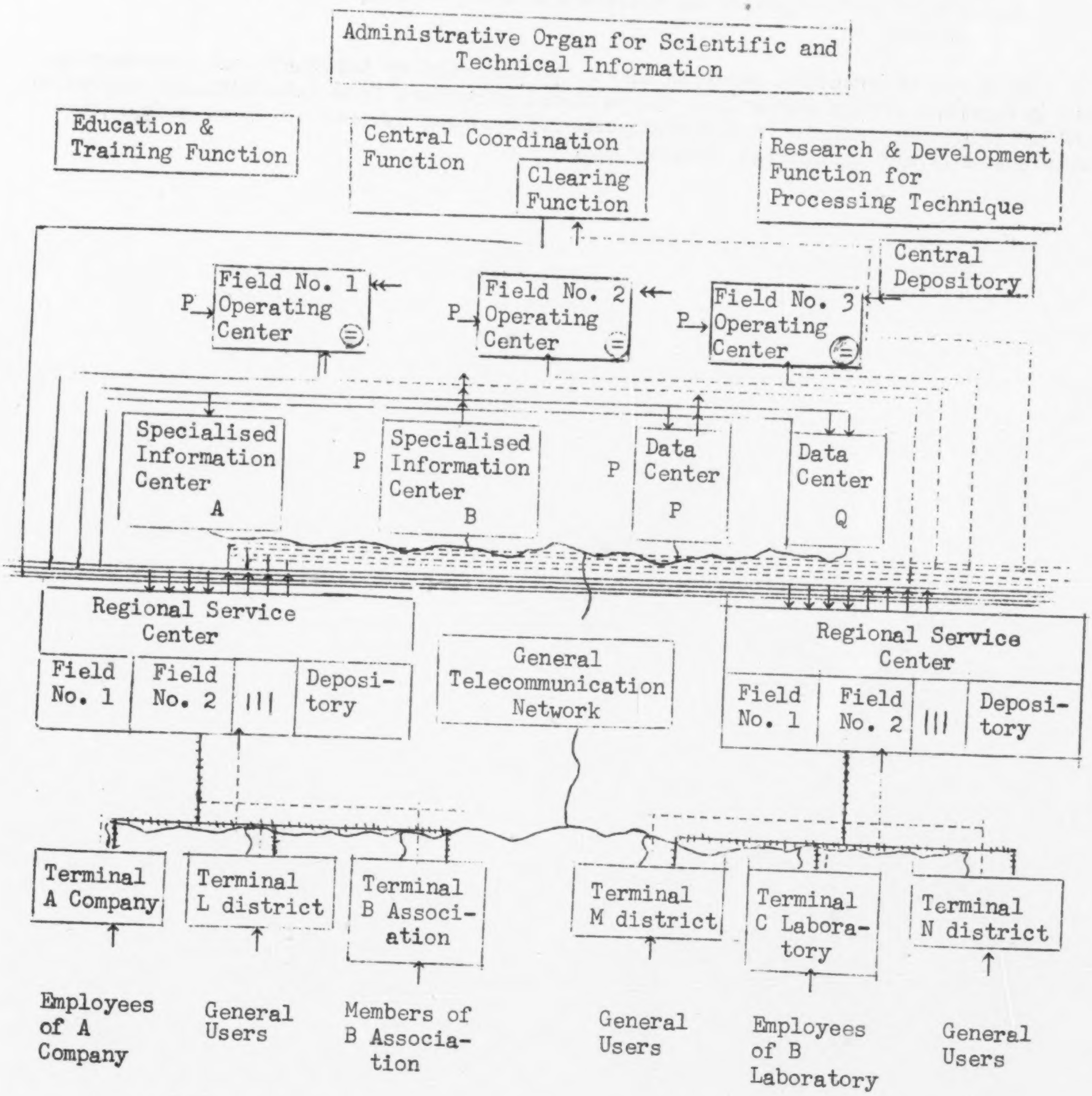
(5) Encouragement of R & D in information processing technology

Research and development works should be carried out in private sectors as far as possible, but those unfit for private efforts such as pertaining to basic research must be driven forward by creating government-financed research institutions exclusively devoted to this purpose or repleting existing organizations.

(6) Active participation in cooperation with international information systems

As S & T information services are to be comleted by international cooperation, the government should streamline the national structure from international viewpoint and actively participate in international information systems in close cooperation with academic and industrial communities.

Fig. 1. Flow of Information in National Information System for Science and Technology (NIST)


Administrative Organ for Scientific and Technical Information
Education & Training Function
Central Coordination Function
Clearing Function
Research & Development Function for Processing Technique
Central Depository
P
Field No. 1 Operating Center
P
Field No. 2 Operating Center
P
Field No. 3 Operating Center
Specialised Information Center A
P
Specialised Information Center B
P
Data Center P
Data Center Q
Regional Service Center
Field No. 1
Field No. 2
Deposi-tory
General Telecommunication Network
Regional Service Center
Field No. 1
Field No. 2
Deposi-tory
Terminal A Company
Terminal L district
Terminal B Associa-tion
Terminal M district
Terminal C Labora-tory
Terminal N district
Employees of A Company
General Users
Members of B Associa-tion
General Users
Employees of B Laboratory
General Users

(Note) Only principal divisions of responsibility have been indicated for the functions and information transfer routes of the various centers but suitable functions may be performed for cases other than those indicated above:

←—+ Collecting publications, primary information.

<-<-<- - Dispatch of primary information obtained.

<- -<- Supply of published specific primary information.

——→ Dispatch of secondary information produced.

P ——→ General supply of publications, secondary information.

⊜ Production of secondary information.

∿∿ Request and supply of specific information requested by user.

+++++++ Supply of general information requested by user.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

DISCUSSIONS ON INTERNATIONAL COOPERATION IN THE FIELD OF DOCUMENTATION

18 August 1970

by Mr. Yukio Nakamura

Coordinator

At the outset, Mr. Nakamura invited discussions on the following lines:

A. Items of possible cooperation:

  (i) In documentation work, e.g. training, exchange of materials, standardization in documentation, etc.

  (ii) In some technical matters, e.g. in information storage and retrieval techniques, flow of information, etc.

  (iii) In some specialized subject fields, e.g. life science, industry, etc.

B. Who does cooperation, individuals?

Organizations?

C. Universal Cooperation.

Mr. Sharma (India) remarked that it is desirable to have regional as well as world-wide cooperation.

Mr. Nakamura stated that he would invite participants from individual countries to state their requirements as well as the facilities they could offer in forthering regional as well would-wide cooperation.

Mrs. Martono (Indonesia) at this stage remarked that there should be discussion on the technique of dissemination of information within the countries of this area.

Mr. Nakamura then observed that the most important aspect of cooperation is between organizations. For this, there should be nation-side information systems in the individual countries. Such systems existed in some countries of this region. He then invited the attention of the participants to the proposed system for Japan, which has been accepted by the Japanese Government on principle. He went on to give a brief outline of this system. One important feature of the proposals is the system concept consisting of sub-systems in the various fields, such as physical sciences and applications, agriculture and bio-sciences, medicine, etc.

He also pointed out that the concept of a world-wide system can be operated effectively through the national systems. For this, the UNIST must have access to the national systems. The NIST in Japan would in fact provide such access.

Mr. Nakamura then wanted to know the situation in the individual countries.

Mr. Guha (India) gave an outline of the situation in his country. He stated that the concept of information network has, in recent years, attracted attention in all quarters and has undoubtedly added a new dimension to the organization of documentation services in India. It has been realized that an obvious and immediate task would be to expand, reorganize, and equip the existing national agency, i.e. INSDOC, to enable it to undertake new responsibilities as a truly capping agency in the national information network. The Council of Scientific and Industrial Research (C.S.I.R.) has drawn up a plan to set up a new organization entitled the National Institute of Technical Information (NITI), with the present publications and information directorate and the INSDOC as the nucleus. The NITI would be responsible for developing the National Science Library on a full-fledged scale, compiling union catalogues, stepping up the translation potential within the country, publishing secondary periodicals, developing computerized information processing facilities, building up reprographic facilities, conducting advanced training programmes in documentation, technical translation, and reprography; coordinating information activities of the various organizations in India, and establishing international collaboration in the fields of scientific and technical information

Apart from INSDOC's effort to coordinate documentation, the concept of national information networks for a few specialized subjects has started gaining ground. These networks aim to centralize, integrate, exploit, and augment the existing information resources like technical literature, personnel and equipment on a national level. This trend is clearly discernible in the fields of Electronics, Agriculture, and Medicine. As a matter of fact, the Government of India has declared the Central Medical Library of the Director-General of Health Services as the National Medical Library in 1966. It is hoped that this library will play the pivotal role in the information network for medicine.

Something very similar has been developing in the field of agriculture too, where the capping agency of the network would be the Library of the Indian Agricultural Research Institute.

Recently, the initiatives of a number of technical information centres in the defence science laboratories have been integrated with the work done at the headquarters at Delhi into a central Defence Scientific Documentation Centre (DESIDOC). This organization is functioning for the last two years and has close collaboration with INSDOC.

Mr. Chong (Korea) then gave an outline of the information system operating in his country. He stated that his government was planning to establish an information system similar to NIST (in India). A large number of research institutions in every field of science and technology exists in Korea. These institutions are served by KORSTIC. It also serves individual scientists and engineers and other technical professioners.

The Korean Institute of Science and Technology(KIST) also has a science information division. In collaboration with KIST, KORSTIC is planning for the establishment of a scientific and technological information system for the country with the assistance of the government.

Recently, there has been an agreement between the governments of Japan and Korea for cooperation in the field of science and technology, including scientific information. This agreement provides for the training of information specialists and exchange of materials between JICST and KORSTIC. He said his country is eager to extend such cooperation with other countries of Asia.

Mr. Nakamura at this stage wanted to know if these would be any link between KORSTIC and KIST, to which Mr. Chong replied in the affirmative.

Mrs. Kuo (China) then gave an outline of the activities of the Scientific Documentation & Instrumentation Centre (SDIC) in her country.

She said that the Center has a very close relationships with several research centers, such as: Physics Center, Chemistry Center, Agriculture Center, Engineering Center, Biology Center, Mathematics Center, etc. and Hsinchu Industrial Research Park, which includes four research institutes: National Chiao Tung University, National Tsing Hua University, China Glass Industrial Research Institute, Food Industrial Research Institute; all these research Centers are located in different geographical areas, they are the largest generator of primary scientific and technological informations through organizing specialists in their respective fields, and publishing journals for the disseminations of scientific knowledge. These Centers are reinforcing information services for the research and development of SDIC, aiming to be specialized information Centers in their respective fields.

Mrs. Martono (Indonesia) said that the Indonesian Scientific Documentation Centre has been acting as an information centre for science and technology uptil now. But its information activities were so far limited. Services are provided free of charge to anyone who needs it. Requests may be made by letter, phone call or by coming to the centre.

In January 1971, information for industry will be proposed to "the Workshop on Industrial Research" in Djakarta. The Ministry of Public Works has set-up a Building Information Centre this year located Jakarta, and plans to set up regional information centres in other areas as Denpasar (Bali), Surabaya, Jogjakarta, Medan (Sumatra), etc.

Besides, every government research institute acts as a technical information agent for its own field.

Mr. Hassan (Malaysia) then described the situation in his country. He said that documentation is still a new concept in Malaysia, and they do not have a documentation centre yet. However, there is a trend towards the setting up of specialized research centres in the country. These are the Institute of Medical Research, the Rubber Research Institute. Recently, the Malaysian Agricultural Research Developmental Institute has been established. It is therefore a matter of time before a national information centre will evolve to meet the requirements of these research institutions. Meanwhile, the research papers of these institutions are kept at the National Archives of Malaysia.

Mr. Salam (Pakistan) briefly narrated the activities of the Pakistan National Scientific and Technical Documentation Centre (PANSDOC) which has been functioning since 1957.

As a national centre, the services of Pansdoc are equally available to scientific institutions all over the country. A few organizations, however, such as the Atomic Energy Commission, the Jinhah Postgraduate Medical Centre, the Defence Science Organization have established their own information cells or divisions. The Information Division of the Pakistan Institute of Nuclear Science and Technology (PINSTECH) has recently been designated as national liaison for the International Nuclear Information System (INIS) of the IAEA. This division is being developed as a specialized centre for nuclear science information in the country.

A plan for the reorganization of PANSDOC and recasting it under the name of the National Scientific and Technical Information and Statistical Centre (NSTISC) is now under the consideration of the government. It envisages a network of two main centres at Karachi and Dacca, with five regional centres in both the regions of the country, to meet our peculiar geographical situation. The services to be provided by the NSTISC will include, in addition to the existing services of PANSDOC, information transfer services covering the major fields of science and industry relevant to the requirements of the country. These services will be based on materials to be collected in the National Science Libraries, which will be an integral part of the NSTISC. Other specialized centres, such as the one being developed at PINSTECH, as well as those which will be developed in future, will augment and supplement the efforts of the NSTISC; and will thus form a nation-wide network of information services for science and industry in Pakistan.

Mrs. Ramos (Philippines) said that in her country, scientific documentation services are provided by the Division of Documentation of the National Institute of Science and Technology (NIST). The Centre was established with the assistance of Unesco, and serves equally all the scientific and technical institutions in the country. It is equipped with a well-stocked library. The Centre publishes the Philippines Abstracts, which is widely circulated allover the world.

The services of this Centre is supplemented by the resources of the other scientific institutions in the country, who have got their own documentation or information cells, mainly intended to provide the information requirements of their scientists.

Mrs. Xuan (Singapore) narrated the situation in her country. There is at present no documentation centre in the country, but scientific and technical information is provided by a number of research organizations, institutes of higher learning and government departments.

Certain developments towards the establishment of a documentation centre in Singapore has, however, taken place recently. The Government has obtained the services of a Unesco expect to advise and assess the need for an information centre to assist the industries and the research organizations and the expert has recommended the setting up of a scientific and technical information centre for Singapore in the very near future.

Mrs. Choosup (Thailand) then spoke. She said that the demand of documentation service in Thailand is met by Thai National Documentation Centre (TNDC), which was established in 1961. It gives services on request in compiling bibliography, procurement of document and translation of scientific paper. Each government department has library collections in its own specific field. These libraries are active and do some bibliography compiling and providing of photoduplicate of literature:As the country is developing small industry, requests in the field of engineering and technology and related field are arising. Demand of informations service is now increasing. TNDC is not able to response, due to lacking of well trained personnel. At present it is planned to build up information service and seek for instructor. Japan nation-wide network is interesting. As this activity is formed by computer, Thailand is not able to afford its cost. If international cooperation or aid is organized, it would make our program possible.

Mr. Nakamura thanked the participants and requested them to prepare their own outline for further discussions.

Mr. Salam (Pakistan) put forward a plea for effective regional cooperation in the matter of exchange of information materials. He advocated the establishment of a regional clearing-house for this purpose.

Mr. Sharma (India) supported the proposal of Mr. Salam and opined that Japan should play a leading role in facilitating the flow of information in this region. He also mentioned the difficulties faced by developing countries due to lack of technical personnel and materials. He put forward a plea that nations of Asia should devise ways and means of such cooperation.

Mr. Guha (India) also supported the idea of a clearing-house for this region. He mentioned the difficulty of acquiring non-commercial publications.

Mr. Nakamura then invited the opinion of Mr. Kobayashi of JICST in the respect.

Mr. Kobayashi (JICST) said he realized the utility of a clearing-house, which has also been put forth by Unesco Regional Office, Djakarta. Such a clearing house should function in cooperation with the national Centres. He felt that some action must be taken at an early date.

Mr. Nakamura wanted to know if the proposal put foward by Mr. McDivit is an official one. It seemed that it is a semi-official one, which Unesco would examine if requested by member countries. Further discussion was postponed to a later session in order to allow members to study the proposal.

Mr. Sharma (India) remarked that it is desirable to provide training for information retrieval by mechanized systems as well as in reprographic techniques.

Mrs. Ramos (Philippines) wanted to know if it is possible for Unesco to provide training in reprography to which Mr. Nakmura replied in the affirmative.

Mrs. Martono (Indonesia) opined that learning of such techniques which cannot be applied in actual practice is not so useful.

Mr. Sharma (India) remarked that application of such techniques has to be created.

Mr. Amin (Malaysia) thought that the training which cannot be applied immediately is not very fruitful.

Mr. Salam (Pakistan) maintained that learning of new teachniques with no prospect of immediate application is not entirely a waste. We have to apply our knowledge to improve things in our countries and create new facilities. Progress has to be thrust upon us some times.

Mrs. Ramos (Philippines) believed that training is not given unless there is a necessity for it, and training provided is not wasted. It is utilized in some way or other.

Mr. Nakamura remarked that Unesco does not provide training unless the country concerned asks for it.

Mrs. Choosup (Thailand) thought that training should be organized to meet the specific need of the member countries. There is no need to organize general courses like the present one. Training should be provided in the various organizations where such facilties exist.

Mrs. Xuan (Singapore) thought that training facilities should be conveniently located where facilities are available.

Mrs. San Luis (Philippines) thought that training is necessary for progress.

Mr. Nakamura opined that it is for the member governments to see that trainees should have the necessary background.

Mrs. Martono (Indonesia) thought that reprography should not be given too much emphasis in training for documentalists.

Mr. Nakamura said that reprography is a part of documentation technique. So it is useful for documentalists to be familiar with it. He said that the concept of this training course was drown up with a view to meet the needs of the Asian countries. If this course didn't meet that requirement, what else should have been done?

Mrs. Martono (Indonesia) thought that industrial application of international techniques should have been given due weightage. This view was shared by Mrs. Choosup of TNDC.

Mr. Chong (Korea) thought that it is important to have more specialized training e.g. in mechanization of information systems, industrial information, reprography, etc.

Mr. Nakamura thought that many kinds of necessity existed, both for specialized, as well as generalized training. He thought that this proposal has close link with Mr. McDivit's proposals. So this should be taken up in a later session.

Mr. Nakamura wanted to know if Tokyo is suitable for training.

Mr. Salam (Pakistan) thought Tokyo is alright as a Venice for training.

Mr. Nakamura wanted to know if it is preferable to have courses covening all the subject fields in one group, or covening seperate subject fields.

Mrs. Ramos (Philippines) said conferences should be held in specialized fields at suitable intervals.

Mrs. Martono (Indonesia), while supporting such an idea, thought that a general meeting could split into specialized groups. She suggested that Pacific Science Association should have a division dealing with documentation.

Dr. Nakamura mentioned the FID/CAO activities and suggested FID may be asked organize meeting of documentalists.

He thought it is also possible to have bi-lateral relations between the countries. But every possibility must be utilized to promote closer international cooperation. The Government of Japan and Unesco may be approached for the necessary steps. FID/CAO should be asked for their assistance in this respect too.

Mr. Kobayashi (JICST) said FID/CAO discussed exchange of material in its last meeting in April this year. Training was not discussed. But information activities in member countries were discussed.

Prof. Sawamoto (Japan) was then invited to give his views. Thought every country should have a national centre. But he was not sure about creating specialized sub-centres within the country. He warned Asian countries not to copy other nations, but to try to create the system they require. Network idea and system approaches should be examined from the beginning in order to avoid unnecessary complications.

With this, the session was concluded.

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JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

PROCEEDINGS OF SESSION ON REVIEW, SUMMING-UP AND RECOMMENDATIONS

20 August 1970

The morning session started at 9:30 hours with the election of Chairman, Co-Chairman & Rapporteur. The following were unanimously elected.

Chairman: Mr. B. Guha

Co-Chairman: Mrs. C. Choosup

Repporteur: Mr. Mohd. Amin bin Hassan

Chairman:

Started off by mentioning the three main aims of the course, viz:

i) to acquire up-to-date techniques of documentation, especially in the sphere of the application of electronic apparatus

ii) to learn techniques and ways of operating national documentation centres, and

iii) to discuss effective means of promoting international co-operation in the field of documentation

It was therefore quite proper for us to review the whole course in the light of the above aims. What is the participants views on the lectures, practice and visits as regards to each of the three aims. How far were they successful and fruitful would be points for consideration.

Comparative Studies in Conventional Information Retrieval System

Mr. Salam: The course was sufficient and that the lectures and practices brought out the salient differences and advantages of the different forms of IRS.

Mr. Chong: Agreed with Mr. Salam. However, emphasis should be laid in the mechanical and computer aspect of IR.

Mr. Chairman: What about the 'practice sessions' were they sufficient?

Mrs. Ramos: The course was adequate and well-planned. It would, however, be better if the lectures be concentrated in the morning and that the afternoon sessions be devoted to visits and practices, which will be a kind of follow up of the lectures.

Mrs. Kuo: During the course the visits were generally for 'inspection' only and there was no actual practice. It would be better if in future 'the practice session' be really 'practical' and to this effect it is suggested that the participants be divided into three or four smaller groups.

Mr. Salam: The time allocated for practice session is adequate in the context of the short duration of the course as a whole. It would be better if actual 'practice' be given during the visits instead of just touring. The question of places to visit and what to visit need to be carefully examined in drawing up the programme.

Mrs. San Luis: Follow up in the form of practice would be beneficial for a clearer understanding of the lectures.

Mr. Chong: Most of the visits were taken up with explanation of the management aspect of the organization visited. It would be preferable to have visits to a variety of institutions as well.

Mr. Chairman: It is clear that 'there ought to be more visits and practices' but owing to the short duration of the course this was not possible. In view of this it was felt that the visits were quite adequate.

Information Retrieval in Bio-Medicine

The Chairman sought the opinion of participants on this aspect of the course.

Mrs. Kuo: Felt that she has benefitted most from this aspect especially in view of the good English language of the lecturers and that the lectures were very clear indeed. The practice session too was most rewarding.

Mr. Salam: Also agreed to this view.

Principles of Information Processing including the use of Computer

The Chairman requested participants for views on this aspect of the course.

Mrs. Martono: Computer programming and its associate fields were difficult to learn during such a short time. It was therefore necessary to have a more intensive course for 'Computerization'

Mr. Salam: As the course was for general application and brief insight of Computer use, its feasibilities, etc. in Information Retrieval System, the course was quite adequate.

Reprography

Mr. Chairman: As documentalists we are not expert in Reprography, but Reprography is a necessary aspect of modern documentation.

Mrs. Ramos: The course was adequate, especially in connection with the idea of reprography and its applications in Information Retrieval.

Mr. Chairman: There was no practice given in reprography, since it was felt that this was quite unnecessary.

National Network and International Co-operation

Mr. Salam: It is better for us to be allowed to express our own opinion in the course.

Mr. Chairman: Yes, this should be so.

Mr. Sharma: The participants came from different organizations and thus the course has shown the seed of interest in the field of documentation that will eventually bring forth for lasting results. This should be the beginning of further developments and a landmark in Asian documentations.

Mr. Chairman: Perhaps if the duration of the course is longer, then there would be more opportunities for intensive training. However, some participants would not like the idea of having a longer course. The solution therefore is either to have a short course which is general in character and outlook, or to have courses of specialized nature.

Mrs. Martono: As documentalist in Asia there was the need for more specialized courses.

Mr. Sharma: A General Course that is divided into several specialized courses would be advantageous.

Mrs. Ramos: It is quite proper for us also to consider the financial capabilities of the organizing body in demanding one type of course or the others. Since the participants came from varying institutions and background, it would be better if the General Course is divided into several specialized workshops.

Mr. Salam: As this is a refresher course, a general survey of all the various aspects of documentation is quite proper.

Mr. Chairman: The general purpose of the course was 'to enable already trained personnel to keep abreast of recent developments in scientific and technological documentation'. It is therefore adequate for us all to have a general survey of all aspects of documentation, especially on the recent developments in Japan, one of the most advanced country in the world in the sceintific and technological spheres.

Mrs. Martono: It would be better for any organizing body to define the basic qualifications of each participants, as different countries have varying standard of assessment.

Mr. Sharma: A more detailed explanation of aims and basic requirements of the course would be necessary.

Mrs. Ramos: UNESCO should also spelled out the necessary criteria as this would ensure proper selections of participants so as to be at par with each other.

Mrs. Kuo: The organizing body should also be given the opportunity to select the participants. In this respect each country would be required to submit extra names from the required number for the organizing body to select.

Standardization

Mr. Chairman: We shall now discuss the areas where we need to have the standardization and what can be done in this aspect.

Mr. Salam: As standardization has already been taken up by FID and ISO, it is doubtful whether we are competent enough to do so.

Mr. Chairman: We should also examine the areas and avenues where standardization is most needed in Asia. After all FID and ISO could not be expected to cover every fields such as transliteration, contents of pages, etc.

The particiapnts are generally agreed that there is an urgent need for such standardization.

Mr. Co-Chairman: Another aspect of standardization is in the choice of the size of the paper for periodicals, etc.

Mr. Salam: As most of the periodicals are using A4 size, it would be quite proper for us to use A-4 size.

Mr. Chairman: It is difficult to implement this since different publishers favour different sizes and this would be led to paper wastage and uneconomical.

Possibilities of International Co-operation

Mr. Salam: The proposal set forward by Mr. McDevit was adequate and that the UNESCO Commission of each country should be urged to take it up.

Mr. Chairman: How could we ensure that there should be a free flow of information from one country to another. One way to meet this is for each country to adopt a standard set of activities and action for the facilitation and smooth functioning of the Regional Centre.

Mr. Chong: Such standard activities should be promulgated.

Mr. Salam: Most centres have bilateral exchange of publications, however, there is still scope for further improvements in this field, and perhaps through a Regional Centre this could be achieved.

Mr. Chairman: It is difficult for us at the moment to decide on the type of pattern or system we could adopt in respect of computer and its associate fields.

Mrs. Kuo: IRS would be more useful through a beeter system of communication and this could be done in three ways:

1. Transmission of analogue and digital data.
2. Switching functions.
3. Special control functions.

Mr. Chairman: Invitedother comments on any other aspects of International Co-operation.

Mrs. Martono: Since exchange programmes involved use of money, it would be quite proper for us to discuss on the difficulties and foreign exchange restrictions imposed by certain countries.

A lengthy discussion followed on the experiences of participants from Pakistan and India as regards to UNESCO Book Coupons. And it was finally agreed that the following two recommendations should be made to UNESCO concerning Book Coupons:

1. That the scheme should be expanded to cover other educational documentation equipments
2. That more funds should be allocated to this Book Coupons.

UNESCO should also be urged to establish organized exchange system through national centres.

Mr. Chairman: Mr. Kobayashi from JICST would like to say something on the bibliographic project planned by the Agency of Science and Technology in Japan.

Mr. Kobayashi: This is not an official statement but at this moment JICST is seeking budget to publish a kind of bibliography of Japanese periodicals in English. Original titles in Japanese would be given an equivalent English transliteration and this bibliography will be published at regular intervals and distributed free of charge to documentation centres. Perhaps participants here could indicate what form, viz. either subject, author or title form of classifications should be used what subject field is favoured.

Mr. Co-Chairman: Broad subject classifications would be most appropriate and an annual cumulative index would also be useful.

Mr. Chairman: Before closing, are there any other matters to be raised.

Mr. Co-Chairman: Perhaps it would facilitate exchange if all national language publications are given summary abstracts in English.

Mr. Chairman: This might be possible to non-commercial publications, but for commercial publications it might increase the price – even though in Germany most of the learned journals, which are commercially sold, have included English content page, abstracts, etc.

Lastly it should be stressed that the establishment of a 'strong national bulkwork' will ultimately result in the promulgation of International System.

ANNEX 8

Recommendation

Distribution: limited

DOCTEC/DISC/2-2
Tokyo, 20 August 1970
Original: English

JAPANESE NATIONAL COMMISSION FOR UNESCO

TRAINING COURSE IN DOCUMENTATION TECHNIQUES IN ASIA

Tokyo, 20 July - 21 August 1970

RECORDS OF DISCUSSIONS ON THE PROMOTION OF DOCUMENTATION ACTIVITIES IN ASIA

1. The initiatives of Unesco and the Japanese National Commission for Unesco in organizing this course have been greatly appreciated by the participants and it is recommended that such training facilities may be extended to more librarians and documentalists in the region by organizing similar courses in the future. It is also recommended that possibilities of organizing short term courses on specialized areas like Reprography, Mechanized Information Retrieval, indexing and abstracting, etc. may also be explored.

In this context the possibilities of exchange of teachers in documentation and information science may also be explored.

2. The participants to the training course discussed with deep interest Unesco's proposal and initiative (as outlined by Dr. McDevitt, Director, Unesco Field Science Office for Southeast Asia) in investigating the possibility of setting up of a regional scientific and technical information centre as an initial response to one of the important recommendations of CASTASIA.

The participants also discussed about the function of such a regional centre and strongly recommend that whatever be the ultimate shape and structure of this proposed regional centre, it must take upon itself the role of an effective clearing house for publications generated within the region, both commercials and non-commercial publications.

3. In the context of international cooperation, in general, and the proposed regional scientific and technical information centre in particular, it was felt that the Asian countries should adopt certain common standards in their publication and documentation practices. Areas where such standards seem to be desirable are -- transliteration (from Asian languages into Roman scripts), table of contents pages of periodicals, and format of periodicals.

In the matter of standards for table of contents pages it was felt that every periodical in a local language should also provide an alternative contents page, giving all the necessary bibliographical items and abstracts of articles, in any one of the internationally accepted languages.

4. It is recommended that in the same context, as mentioned above, the national documentation centres of Asia should adopt certain common standards in information storage and retrieval techniques. Perhaps the forthcoming meeting of the heads of Asian documentation centres (to be held sometime in September 1970) may be a suitable forum for the consideration of such matters in details.

5. The foreign exchange difficulties in the procurement of materials experienced by most of the countries make the participants suggest that the respective national governments should make bigger allocations in forms of Unesco book coupons. At the same time all efforts should be made to have better exchange arrangements between the Asian countries.

6. The concept of national information network was discussed in detail and it is felt that the importance of this concept need to be brought to the attention of all parties concerned viz, librarians, documentalists, users of information, and planners and it is recommended that in all future national plans for library and information provision the concept of network be given highest consideration.

7. It is hereby resolved by all the participants that a vast of thanks and appreciation be given to the Japanese National Commission for Unesco for initiating this course and also to try socialized members for their unrelentless devotion to duties in making this course a success.